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FORTY-EIGHT CASES OF DELIVERY BY ABDOMINAL SECTION

BY EDWARD P. DAVIS, M. D., PHILADELPHIA

Professor of Obstetrics in Jefferson Medical College, etc.

THE clinical study of the following cases of delivery by abdominal section suggests points concerning the choice of operation and the method for its performance. The limits of space prevent an extended comparison of delivery by abdominal section, the induction of labor, and other methods of delivery.

These operations were performed in one maternity hospital, three general hospitals, one private surgical hospital, and two private houses. While at the Jefferson Maternity the assistance was essentially the same, yet through the whole series there was a considerable variation in those who assisted. These varying circumstances under which operation was done corresponded in considerable degree to the conditions which must often be met in performing Cæsarean section in private houses.

The indications for the operation were: Disproportion between mother and child in 42 cases; fibroid tumors of the uterus delaying labor or making it impossible in 2 cases; eclampsia, 3 cases; melancholia, breech-presentation of the fœtus, absence of labor pains, 1 case.

Of these patients, 13 were multiparæ and 35 primiparæ. Of the multiparæ, none died, while 11 of the 13 had lost children in previous labors, and hence consented gladly to the operation with the hope of saving the child.

Of these operations, 26 were celiohysterotomy, 18 were celiohysterectomy, 3 were Porro operations, and 1 post-mortem incision.

The patients that were uninfected at labor numbered 39, and among these there was one death, making a mortality percentage of 2.6.

The case uninfected before labor and dying after delivery was that of a negro woman with contracted pelvis, who, after labor, had signs of peritoneal septic infection. The temperature remained low, but the pulse rose steadily. On autopsy, the uterus was found healed and sterile, but a diffuse peritonitis was present, caused by the bacillus proteus vulgaris. It was thought that this might have resulted from the use of infected catgut to close the peritoneum, but a sample of the gut, on bacteriological examination, was found sterile.

Among these patients, there were six who were undoubtedly infected at the time of labor by septic infection. In these cases, the site of the infection was the intestinal tract in one, the uterine lining membrane and muscle in four, a Fallopian tube in one. Of these infected patients, three recovered and three died. In each fatal case, a thorough autopsy was made, with bacteriological examination when indicated.

The patients that recovered although infected had the Porro operation in two cases, while one case had the removal of the uterus,

tubes, and ovaries more than a year after the Cæsarean section.

Three cases of eclampsia were delivered by abdominal section, as follows:

The first was that of a primipara, admitted to the Maternity comatose after severe convulsions. The patient was about eight months advanced, had a highly contracted pelvis, with ankylosis of one hip-joint. The conditions did not permit vaginal manipulation, and the patient was thought to be moribund. The fœtus was extracted by abdominal incision, to give it a chance for life, and the uterus and abdomen closed by suture. The child was dead, but, much to the surprise of those who saw the patient, she became conscious after operation and lived for several days. Autopsy in this case showed highly developed interstitial nephritis, with the corresponding changes in the blood-vessels of other organs.

The second case of eclampsia was that of a young primipara, brought to Philadelphia on the verge of eclampsia, and almost blind from albuminuric retinitis. Labor was induced, but convulsions followed. The patient was small and ill-developed, and it was thought best to deliver her as rapidly as possible. Her child survived delivery for several hours, although premature. Some hours after delivery the mother had a uterine hemorrhage, became comatose, and died. An autopsy could not be obtained.

The third case of eclampsia was post-mortem. The writer was called in consultation, and was informed, as he entered the house, that the patient had just died. Obtaining permission to save the child, the abdomen and uterus were quickly opened, the child extracted, surrounded by heat, and taken at once to the Maternity. It was given a healthy wet-nurse, and thrived for two weeks; then it developed toxæmia, and died of eclampsia.

Of the children born in these cases, none died that were in good condition at the time of operation. In making this statement, we believe that the child delivered post-mortem from an eclamptic mother was already poisoned by the toxines which destroyed the mother before it was delivered. The child survived operation in good health for two weeks, and strong hopes were entertained for its complete recovery. The total number of deaths of children in 48 cases was 8. Of these, four were dead before delivery was attempted; one, as already described, died after post-mortem delivery, of eclampsia, two weeks later; one child, born at seven months, died several days after birth, from inanition; one died from inanition and failure to assimilate food, a week after birth; and one died of bronchopneumonia, resulting from influenza, ten days after birth. No child perished during or immediately after the operation that was living or in good condition when the operation was performed.

As regards the indication for operation described as disproportion between mother and child, in the great majority of cases contraction of the pelvis was obviously present; this varied in degree from an internal antero-posterior diameter of five centimeters up to the normal measurement. Where the pelvic measurements were apparently normal, the size of the child was abnormal and disproportionate. The diagnosis of disproportion was made by measuring the mother's pelvis by external pelvimetry and internal palpation. When labor occurred, every effort was made to bring about engagement and descent of the presenting part. Malpresentations and malpositions were rectified, if possible. The membranes were preserved unruptured. The bladder and rectum of the patient were kept empty. Strychnia and alcohol were given if required, and opium and bromides if sedatives were needed. Posture was utilized, and the patient was allowed to be from one to six hours in vigorous labor without engagement of the head before a diagnosis of disproportion was made. On several occasions a presentation of the parietal bone with transverse impaction of the head above the brim was at first mistaken for engagement by the resident staff, but as descent did not follow, the true diagnosis was speedily made. No efforts were made to pull the head into the pelvis by forceps, nor was version performed when disproportion was evidently present. In one of the cases, induction of labor had been performed by the introduction of bougies, which brought on uterine contractions, but failed to bring about engagement. The strongest evidence of disproportion was found to be the failure of the presenting part to engage in

the pelvis, after ample time and with strong uterine contractions, and when the patient had received every assistance except forcible efforts to drag the presenting part into the pelvis.

The technique practised in these operations is described in the department of technique in the present number of SURGERY, GYNECOLOGY AND OBSTETRICS.

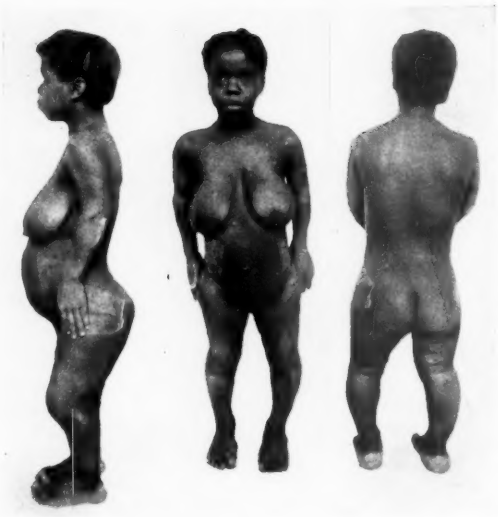
These patients are naturally divided into two classes: the married and the unmarried. In dealing with married patients, so soon as diagnosis of disproportion or other conditions which may demand delivery by operation is made, the husband should be informed of the condition present; if he is not available, the nearest responsible relative should be consulted. The wife should also be told, and the question of choice of operations should be stated clearly. Induction of labor, with its mortality and morbidity for mother and child, forceps, version, and craniotomy, should all be discussed. The mother should also be told that there is no absolute test in these cases except that of active labor, and that many cases which threaten difficulty proceed to spontaneous parturition. The parties interested should then elect the induction of labor if the pelvis is sufficiently large to justify this, or should elect to allow pregnancy to go to term, hoping that spontaneous parturition, or at least engagement of the fœtus in the pelvis, will occur. It should, however, be understood that if the patient goes to term and engagement does not occur, the obstetrician in charge of the case shall be allowed to perform whatever operation, in his judgment, will best protect the interests of mother and child. If the parents elect a possible Cæsarean section, the physician should urge, if the patient is a primipara in good general health, that sterilization should not be performed. Repeated Cæsarean section has not a high mortality, and if the first child should die, the parents might be greatly disappointed that the birth of another had been rendered impossible.

In dealing with unmarried patients, they are seldom seen at a time when the induction of labor is justifiable. They usually come under observation very shortly before confinement, and must then take the chances of parturition. Many of them cannot understand the difference between various operations, and most of them will demand craniotomy upon the living, uninjured child. If these patients are in hospital, or are seen sufficiently early in labor, we believe it to be the duty of the physician not to accede to the demand for craniotomy, but, if necessary, to deliver the woman by abdominal section. Her consent can usually be obtained if she be told that the suffering of labor will be terminated, that she must take ether, and that her life and the life of the child will probably be saved. These patients, also, should not be sterilized without their previous consent, unless some condition is found which makes it unsafe to allow the uterus to remain. The cases reported were treated in accordance with the principles just enunciated.

The morbidity among the mothers was 5 in 47 cases, as follows:

After celiohysterectomy, one patient had hæmatoma in the pelvis following the wound of a vein in the broad ligament. This hæmatoma was evacuated through the vagina later, and finally a silk suture was discharged through the vagina. The patient then made a complete recovery. She was last seen a year after the operation, in good health. Also, after celiohysterectomy a patient had a necrotic discharge from the vagina accompanied by the discharge of a silk ligature. From this she completely recovered.

After celiohysterotomy, one patient had stitch infection, which she purposely accomplished. She was a negro girl with a highly contracted pelvis, and was doing well after operation, but objected to recovering too rapidly, because she would have to leave her bed; accordingly, she worked her fingers under the dressing and infected two abdominal stitches. Her fingers were probably soiled with lochial discharge, as she also disturbed the vaginal dressing. This infection traveled to the peritoneum, where the anterior uterine wall was adherent and thence infected a silk stitch in the uterus. There followed a fistula between the uterine cavity and the surface of the abdomen, through which the silk stitch was finally discharged. The patient ultimately made a good recovery. Another case of celiohysterotomy had stitch infection, followed by the discharge of the silk suture from the uterus. A third



Mrs. J. W. Celiohysterectomy.

patient had attempted delivery in her own house by means of forceps. This failing, the patient was brought to the Maternity for operation. She developed infection of one of the uterine stitches, which began from the uterus and gradually spread to the abdomen. A fistula ensued, which lasted for some months, finally resulting in the discharge of a silk stitch. Some time after this the patient developed a tumor in the abdominal wall, which was incised and found to be an abscess. This was drained, with the hope that healing would follow. She ultimately, however, went to another hospital, where she was operated upon by the removal of the uterus, tubes, and ovaries for a chronically infected condition. This case draws attention to the fact that cases which have been subjected to forceps attempts and other manipulations in the average house should not be subjected to Cæsarean section. Such cases are, practically, to be considered as infected. The morbidity rate, then, of this series of cases is a little over ten per cent. In but one case — that ending in hysterectomy — did the complication causing the morbidity result seriously.

When the series of 47 mothers is considered, and the mortality is estimated, from any and all causes, it is found to be 6 in 47, or 12 per cent. This includes eclampsia and cases operated upon in desperate condition from long continued labor and fruitless attempts at delivery.

The following cases illustrate the different conditions for which the operation was performed:

Mrs. J. W., aged 28, primipara, negro, sent by physician in New Jersey, who had given her, hypodermatically, morphia to lessen strong uterine contractions. The patient was a rachitic dwarf (photograph appended). Pelvis: Anterior superior spines, 22 cm.; crests, 21 cm.; trochanters, 27 cm.; right diagonal, 17 cm.; left diagonal, 17½ cm.; external conjugate, 17 cm.; internal conjugate, by measurement, 5 cm.; circumference, 74 cm. The patient highly rachitic; child living and in good condition. No attempt at delivery had been made; cervix partly dilated; considerable amniotic liquid still present; operation as soon as possible, as uterine contractions were becoming vigorous. Mother and child recovered without complications. The child was a male, weighing 5 pounds 14 ounces; highly rachitic. Measurements of the

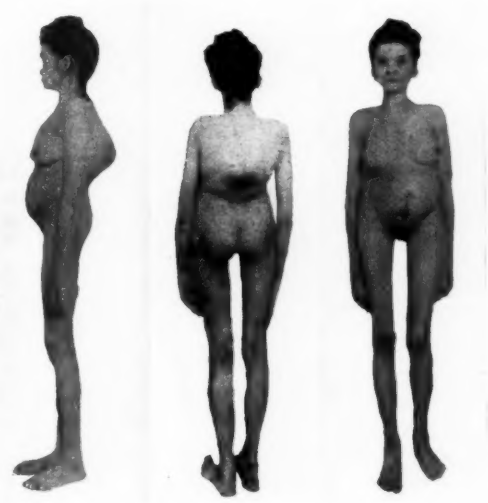
Child. Mrs. J. W. Celiohysterectomy.

cranium were as follows: Maximum, 13 cm.; occipito-mental, 12½ cm.; suboccipito-bregmatic, 9½ cm.; fronto-mental, 9 cm.; trachelobregmatic, 10½ cm.; biparietal, 10 cm.; bitemporal, 7½ cm.; bimastoid, 8 cm.; bisacromial, 10+ cm.; bistrochanteric, 8 cm.; length, 41½ cm.; circumference of cranium, 35 cm. Circumference of chest, 27 cm. A photograph of the child, appended, shows its high degree of rachitis and its close resemblance to the mother. Although this patient came from some distance with an indefinite history, it was evident that the attending physician had wisely abstained from all interference, and therefore operation was at once performed. The mother nursed the child, and both left the Maternity well.

Mrs. S. W., aged 36, primipara; had double hip-joint disease at ten years of age. Pelvis: Spines, 25 cm.; crests, 25 cm.; trochanters, 27 cm.; right diagonal, 20 cm.; left diagonal, 22 cm.; external conjugate, 17 cm.; internal conjugate, 7½ cm.; circumference, 85 cm. The pubes were 7½ cm. high; the pubic arch very narrow; the pelvic floor tense and resisting; and it was impossible to separate the patient's thighs sufficiently to perform any vaginal manipulation. The fœtal head could not be felt from the vagina. The pelvis was very narrow and deep. The patient and her husband requested celiohysterectomy, to avoid future impregnation. At operation, some difficulty was experienced in placing the patient on the table, because of the immobile condition of the thighs. Celiohysterectomy was done in the first stage of labor, when the cervix was sufficiently opened to permit drainage, which might be necessary. Mother and child recovered without complications.

Mrs. C. W., aged 39, primipara, emaciated, anæmic; marked spinal kyphosis; left inguinal region shows scar of tubercular abscess in hip; left lung had impaired resonance at the apex. Patient has no cough, but has always been deformed and delicate. Pelvis: Spines, 22½ cm.; crests, 25 cm.; trochanters, 28 cm.; right diagonal, 18½ cm.; left diagonal, 20 cm.; external conjugate, 16 cm.; internal conjugate, by measure, 7 cm.; circumference, 71 cm. Pregnancy had reached the seventh month, but the patient was suffering severely from dyspnœa, occasioned by pressure of the uterus against the diaphragm, produced by the marked deformity of the spinal column. She was placed in bed and given food and stimulants, thereby hoping to prolong the pregnancy as far as possible. The birth-canal was so poorly developed and the thigh so immobile that vaginal manipulation was impossible. The patient and her husband requested that operation be done and future pregnancy prevented. It was decided to perform the Porro operation, because it could be done more quickly than one of the other varieties. When the patient showed signs of premature labor she was anæsthetized by chloroform and oxygen, skillfully given by Dr. Foulkrod, and the Porro operation was performed. Thirty-five minutes was required for the complete operation.

The patient made a good recovery; the child was puny, surviving the operation three days, dying on the fourth, of inanition. Here our hope was to prolong the pregnancy until the child should become sufficiently strong to survive. The patient, however, came into premature labor, and as it was impossible to care for her by vaginal delivery, and as sterilization was requested, the operation was performed.



Mrs. C. W. Porro operation.

Mrs. C. B., multipara, aged 25; had lost children in birth; had been 48 hours in labor when admitted, with two attempts at delivery by forceps. On examination, the child was dead; the pelvis flat rachitic, measuring: Spines, 26 cm.; crests, 26 cm.; trochanters, 29 cm.; diagonals, 22 cm.; external conjugate, 17 cm.; internal conjugate, 7 cm. The patient had lost blood before admission, and was in a critical condition. As rapidly as possible she was prepared for operation and for transfusion. Craniotomy was attempted, as the head was presenting, but the head could not be delivered in this way. There was every reason to believe the patient infected, as she had not been under good care; accordingly, the Porro operation was performed as rapidly as possible; the patient making a good recovery.

Three years after operation the patient returned; she had worked hard during this time, and had been in good general health. She had a small ventral hernia, for which operation or the use of a pad was advised. She declined operation, and has not since been seen. This

is the only hernia that we have been able to trace in these patients.

Mrs. G., aged 35; eighth pregnancy; had given birth to living twins; six other pregnancies had terminated in the death of the children, because of disproportion. Three attempts had been made by forceps and one by version to deliver the patient. Her pelvis was flat rachitic, and craniotomy done after admission failed. The Porro operation was then performed, from which the patient made a good recovery. This patient was undoubtedly infected before admission, as she had been in a tenement-house, under very poor care.

Mrs. T., aged 20, multipara; lost first child by the use of forceps; second pregnancy terminated by induced labor, child living only one day. Labor performed at a hospital; child placed in an incubator. Pelvis: Spines, 27 cm.; crests, 29 cm.; trochanters, 31 cm.; diagonals, 22 cm.; external conjugate, 17 cm.; internal conjugate, 7½ cm.; circumference, 82 cm. Patient seen in consultation in her house, having been in labor the greater portion of a day without engagement of the head. The attending physician had abstained from efforts to deliver; she was taken immediately by ambulance to the Maternity, and celiohysterotomy performed; the child was a male, weighing 7 pounds 8 ounces, and mother and child recovered without complication.

Mrs. G., the wife of a physician; had been small and rather frail in childhood. Pelvis: Spines, 22 cm.; crests, 24½ cm.; trochanters, 33 cm.; diagonals, 20¾ cm.; external conjugate, 16¾ cm.; internal conjugate, 7½ cm., by measurement; circumference, 80 cm. The first pregnancy was terminated at the request of husband and wife by the induction of labor; difficulty was found in this from the resisting condition of the cervix. It was dilated under chloroform to admit bougies; 24 hours elapsed after their introduction, without pains; an elastic bag produced uterine contractions, but caused so much suffering with so little result, that it was removed; prolapse of the fœtal arm followed, with death of the child. The patient was delivered, under ether, by version.

In the second pregnancy, husband and wife elected celiohysterectomy; they were not advised to do this, but determined not to run the risk of further conception. The operation was performed as soon as the patient came into labor. Mother and child recovered well. For some time the mother had a vaginal discharge from the stump, which finally ceased. The child weighed 7 pounds 14½ ounces, with measurements proportionate to its weight.

Mrs. M., aged 32; four pregnancies. Pelvis: Spines, 25 cm.; crests, 28 cm.; trochanters, 32 cm.; diagonals, 21.5 and 22.5 cm.; external conjugate, 19½ cm.; circumference, 92 cm. Had been a delicate child; had two induced labors for disproportion, at the hands of her family physician, children being lost; third pregnancy terminated spontaneously, at seven months, in the birth of a feeble child, which did not long survive. Very desirous of obtaining a living child. Was admitted to the Maternity when seven months pregnant, and kept in bed two weeks, to avoid premature labor. Was again admitted in beginning labor. Child evidently of good size; no engagement; cervix partly dilated; pains vigorous and becoming stronger. After waiting a reasonable time for engagement, operated with consent of husband and wife. Child male, weighing 8 pounds 8 ounces; delivered by celiohysterotomy. Child's cranium measured: Maximum, 14.25 cm.; occipitomastoid, 13.5 cm.; suboccipito-bregmatic, 10 cm.; frontomental, 9 cm.; trachelobregmatic, 10 cm.; biparietal, 9.75 cm.; bitemporal, 8.75 cm.; bimastoid, 7.5 cm.; bisacromial, 13 cm.; bistrochanteric, 10.5 cm.; length, 51 cm.; circumference of head, 36.5 cm. Circumference of chest, 34 cm. Mother and child left the Maternity in good condition.

A. H., aged 22, primipara. Pelvis: Spines, 24 cm.; crests, 26; trochanters, 28 cm.; diagonals, 20 cm.; external conjugate, 18½ cm.; internal anteroposterior diameter, 9 cm. Was admitted to the Maternity, and labor was induced by the introduction of bougies. Cervix and lower uterine segment were poorly developed and resisting, and although labor pains became vigorous, the head did not engage. Upon operation and extracting the child, the uterine tissue, which was thin and ill-developed, tore, and it was necessary to perform celiohysterectomy. Mother and child made a good recovery.

Mrs. S., wife of physician, aged 36½ years, primipara; anæmic and neurotic; pelvis practically normal. Was brought by her husband in the last ten days of her first pregnancy; had taken no exercise; pulse 100, weak. Patient's nervous and muscular systems poorly developed; in temperament, sallow brunette. Husband desired his wife to receive surgical care during labor; proposed, if possible, that she enter a private surgical hospital for confinement. Through the courtesy of Dr. W. W. Keen, she was admitted to his private hospital. The child was living and in good condition, and evidently above the average in size. The patient went, as nearly as could be estimated, several days beyond 280 without signs of descent or labor. The position and presentation of the child were normal, but there were no symptoms of beginning descent. Husband and wife agreed in their great desire to save the child, and also to avoid complications for the mother. As no sign of normal uterine action developed, they were given the choice of the induction of labor or delivery by section; the risk to mother and child in each being explained as thoroughly as possible. Although nodules could not distinctly be made out, it seemed possible, on palpation, that the uterus contained fibroids; this would account for the uterine inertia present. At the consent of the parents, the patient was prepared for section, and while under ether the cervix was dilated with the fingers sufficiently to permit the introduction of two fingers. On opening the abdomen the uterus was found to be the site of small multiple fibroids, the anterior wall not being involved. In view of the patient's age and the undesirability of cutting off from her all hope of children should the one die, it was determined to try to save the uterus, with the hope that the fibroids would undergo absorption during the puerperal

period. A male child, weighing 8 pounds 2 ounces, was readily delivered and breathed well. As uterine inertia threatened, the uterus was tamponed with iodoform-gauze, the end of which was carried into the vagina. The uterus and abdomen were then closed in the usual manner. The veins of the broad ligament were enormously distended in this case, and there was great distention of all the veins and vessels in the abdomen.

The patient made an uninterrupted recovery, and mother and child are in good condition fifteen months after operation. The uterus became adherent to the anterior abdominal wall, involution proceeded fairly well, and the patient's general condition is much improved.

In this case the choice of operation was left entirely to the parents; the husband of the patient, being a medical man, could choose intelligently between the different operations, and selected what he thought best in the interests of mother and child. Decision to remove the uterus or to leave it was left entirely with the operator.

The feelings of patients in regard to the operation are illustrated by one of the early cases in the series. The woman was the wife of a miner, and exceptionally strong and robust. She had lost four children in difficult labors; she was short, broad-shouldered, with broad hips, and it was not until the pelvis was measured that the cause of the loss of the children became evident. She had a highly flattened pelvis, whose other diameters were above the average. As she and her husband earnestly desired a living child, she was admitted to hospital and successfully delivered by celio-hysterotomy; a vigorous child weighing between ten and eleven pounds was delivered. Mother and child made an uninterrupted recovery. Some months afterwards, the mother reported that she had an abdominal tumor, and on examination she was again found to be pregnant. She had not requested sterilization, and was greatly surprised to find that pregnancy could occur; she had supposed that operation meant inevitably sterilization. This pregnancy was terminated in my absence from the city by a colleague, who, at the patient's request, performed celiohysterectomy. The second child was as large as the other, and was successfully delivered. Mother and child made good recoveries.

The fallacy of relying exclusively upon pelvic measurements to diagnosticate impossible labor is seen in a case admitted to the Philadelphia Hospital, in the service of the writer. The patient, a married woman, had engaged a physician to attend her, who had measured her pelvis. Pelvic contraction was considerable, but not sufficient to indicate absolutely as impossible the birth of a living child. When labor ensued, disproportion was present. Relying upon the pelvic measurements exclusively, the attending physician attempted to deliver by forceps. Failing in this, a second physician was summoned, who repeated the attempt. The mother lost considerable blood and was sent to the hospital, the child dead and the mother exhausted and infected. On thorough examination of the pelvis by palpation, with palpation of the head, it was found that even craniotomy would prove difficult and tedious; accordingly, the patient was delivered by abdominal section, but did not long survive the operation. This case is included among those reported as infected before operation.

Cases occurring among private patients and in private houses where Cæsarean section seems at times indicated, are especially involved. Some of these patients will not go to hospital, and the decision to operate or to abstain from operation, and the effort to bring the relatives to an intelligent decision may prove difficult. The following case indicates what may be encountered in this direction:

Mrs. M., aged between 35 and 40; pelvis normal; muscular and nervous tissues ill-developed; had been married three years; had had one early abortion. Near the end of the second pregnancy she became apathetic and melancholy. Would not take exercise, and took food with great difficulty. She was placed in charge of a nurse and regularly fed and taken into the open air. Her pregnancy extended some days beyond the usual term, and the size of the child was evidently above the average. Difficulty was expected in labor, and this was made known to the husband, and a consultation arranged for if necessary. When labor began, the patient had feeble uterine contractions, which did not develop. She was completely apathetic, and consultation with Dr. B. C. Hirst was called. The child was found to be large, in breech-presentation, the cervix but very little dilated, and the child undescended. To give mother and child the best chance, to save the life of the child and avoid injury to the mother, Cæsarean section was agreed upon. A room was immediately prepared, and the operation done in the patient's house. A male child weighing between nine and ten pounds was born, and mother and child, between five and six years after, are in excellent health.

There has been no subsequent pregnancy in this case. With the full consent of those most interested, the operation was elected to save the mother severe injury and to preserve the life of the child. To deliver a large child in breech-presentation through the undilated birth-canal of a primipara above the average age entails, in the majority of cases, severe injury upon the mother and very considerable risk to the child.

C. T., aged 25, was sent to the Jefferson Maternity during April, 1904, because of her deformed condition. She was in the latter months of pregnancy, a strong, vigorous woman, aside from her deformity. A very pronounced lordosis and a difference of two inches in length between the lower extremities produced excessive inclination of the pelvis. The pelvis measured between the anterior superior spines, 25 cm., and between the outermost points of the crests, 26 cm., between the trochanters, 29 cm., the left oblique diagonal, 21½ cm., the right oblique diagonal, 24½ cm., the external conjugate, 19 cm., and the circumference, 86 cm. It was not possible to make a thorough internal examination, nor was it possible to touch the promontory of the sacrum by vaginal examination, because the movements of the femora upon the pelvis were limited and the patient could not abduct the lower extremities. In addition to her physical deformity, the patient was partially deaf, with very imperfect speech and imperfect mental development. The pregnancy was illegitimate.

The excessive deformity made it extremely unlikely that spontaneous labor would occur. The abnormalities in the patient's nervous system made it most undesirable that she should produce offspring. Her comparative poverty rendered it difficult for her to obtain adequate medical attendance outside of hospitals.

The pelvic contraction, as shown by measurement, was not sufficient to make spontaneous parturition an absolute impossibility; hence it was determined to allow the patient to come into spontaneous labor, hoping that she might deliver her child, possibly with the aid of forceps. In view of all the facts of the case, permission in writing was obtained from her nearest responsible relative to perform any operations thought best in the case. The patient was put in the best possible general condition and allowed to go into spontaneous labor.

Uterine contractions developed with considerable force, and after a number of hours partial dilatation of the cervix was present. The head of the child presented, but remained high above the pelvic brim, nor could manipulation bring about its engagement. The child's heart-beat was vigorous and the mother's condition good. In view of all the conditions present, delivery by abdominal and uterine incision was chosen, followed by the removal of the uterus, tubes, and ovaries.

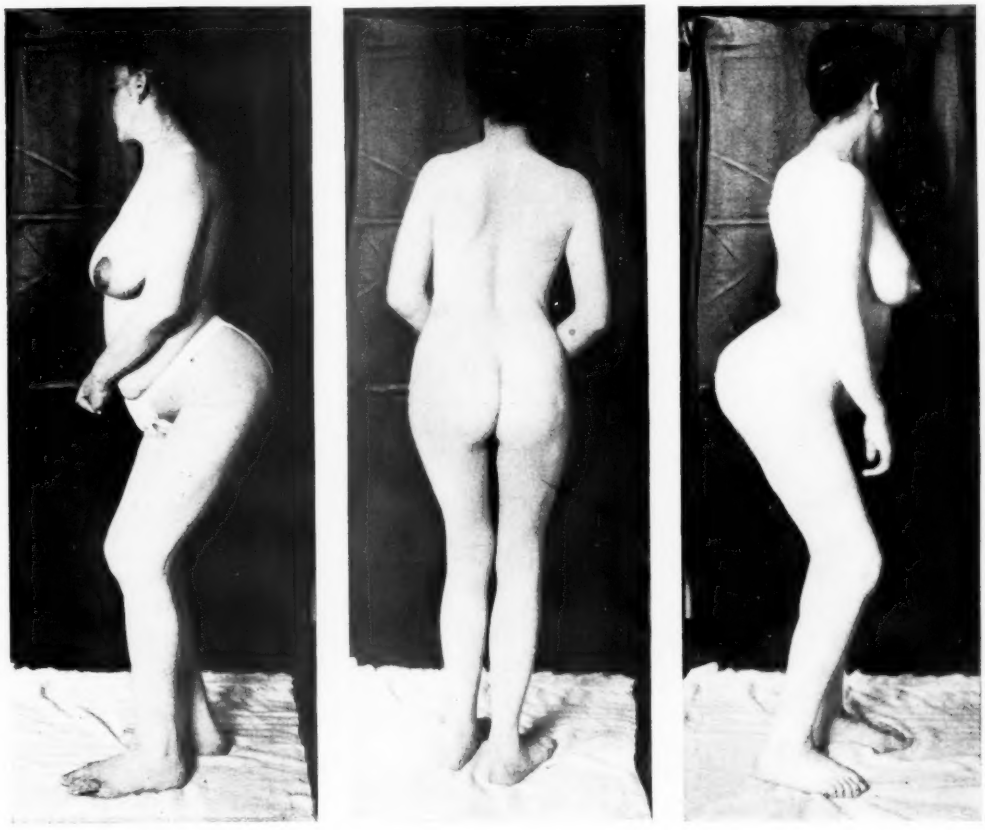
The operation was done as usual, the stump of cervix and all raw surfaces being covered by peritoneum, except the ligatures upon the ovarian arteries. A vigorous male child, weighing seven pounds four ounces, was delivered and the operation completed without accident. No drainage was employed.

During the operation, and for nine days afterward, tracings of the patient's pulse were taken by the Riva Rocci apparatus. A preliminary tracing was taken on the day before the operation for purposes of comparison. In the accompanying chart, the continuous black line represents the blood-pressure, the interrupted red line, the pulse, while the dotted line represents the respiration.

Before the operation, the patient's pulse was 72, her respiration 20, and her blood-pressure 154 mm. of mercury. During anæsthesia by ether, her blood-pressure rose to 185. At the moment of incision, it dropped to 172, and at the moment when the child was extracted it remained at 172. During the thirty-five minutes occupied in the removal of the pelvic organs, blood-pressure tracings were taken at intervals of five minutes, and the pressure steadily declined to 102 mm. of mercury. At this time the patient's pulse rose to 90. One twentieth grain of strychnia was then given by hypodermatic injection. The respiration of the patient was highest at the extraction of the child, when it reached 38 to the minute, thence descending gradually to the normal. As the operation proceeded, the blood-pressure rose to 118, the pulse rising to 100, the respiration falling steadily. A few hours after the completion of the operation, the blood-pressure had reached 168, the pulse was 78, and the respiration varied between 20 and 25. The patient's temperature was very little disturbed by the operation. Her highest temperature during her entire convalescence was 99.8° F., and her lowest temperature, 97.5° F. During the puerperal period, the blood-pressure gradually descended from 169 to 140. At this time the patient's pulse averaged 75 and the respirations 20. The patient was under ether one hour and ten minutes. The duration of the entire operation, including the application of the dressings, was fifty-eight minutes.

The patient's recovery was uneventful. She nursed her child, which did well, and both left the Maternity in excellent condition. Union occurred by first intention without infection. Examination before the patient was discharged revealed a small and movable cervix, the pelvis free from tumor or exudate, and no evidence of hernia.

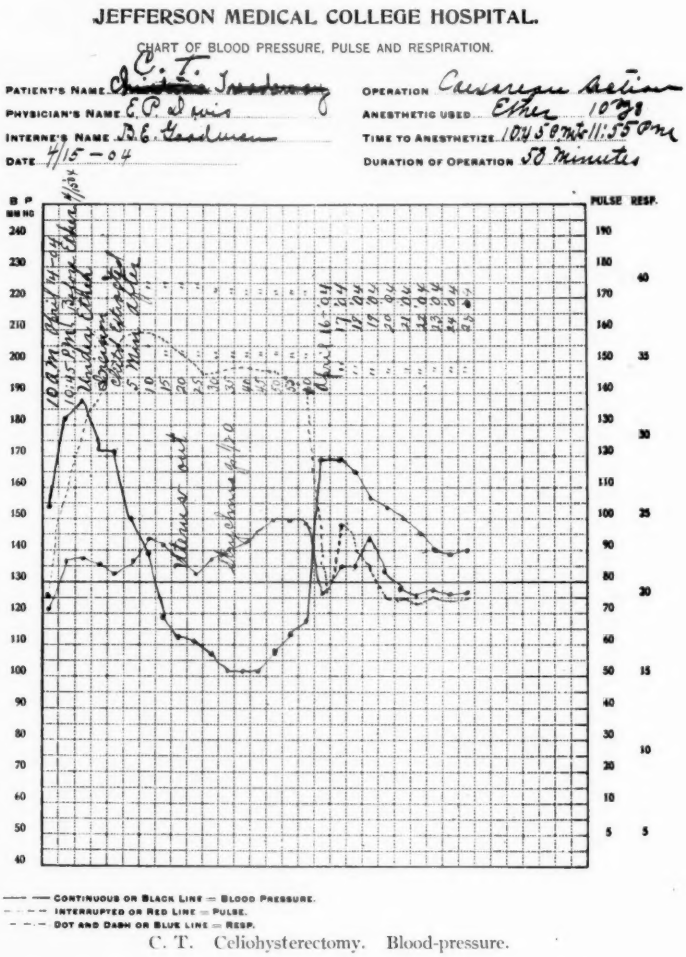
The accompanying illustrations show the patient's deformity. The Röntgen ray picture,



C. T. Celiohysterectomy.

taken by Dr. Manges at the Jefferson Hospital, shows the excessive inclination of the pelvis, its oblique contraction and deformity. The measurements of the child's head and body were normal. The weight of the placenta, its condition, and that of the cord and membranes, were also normal. The patient's general vigor was remarkable, and she requested permission to work before and after the birth of her child.

From the tracings of blood-pressure we may observe certain points of interest. The normal blood-pressure of a pregnant patient before labor averages 130 mm. The occurrence of spontaneous labor increases blood-pressure in proportion to the activity and vigor of uterine contractions. In some of our tracings, blood-pressure has reached 200 mm. during spontaneous labor. In the case under consideration, blood-pressure rose to 150 with the occurrence of labor. Under ether, blood-pressure rises in parturient women. The present case was no exception The incision in the uterus was followed by the loss of blood contained in the placenta, as the placenta lay directly under the line of incision. This bleeding ceased as soon as the placenta was extracted. The extraction of the child was without apparent effect upon the blood-pressure. No further hemorrhage of importance occurred, but during the ligation of the arteries and the removal of the pelvic organs, blood-pressure very steadily


JEFFERSON MEDICAL COLLEGE HOSPITAL.
CHART OF BLOOD PRESSURE, PULSE AND RESPIRATION.
PATIENT'S NAME C. T.
PHYSICIAN'S NAME E. P. Davis
INTERNE'S NAME J. B. Goodman
DATE 4/15-04
OPERATION Caesarean Section
ANESTHETIC USED Ether 10 m
TIME TO ANESTHETIZE 10:50 AM to 11:55 AM
DURATION OF OPERATION 50 Minutes
B P MM HG
PULSE RESP.
CONTINUOUS OR BLACK LINE = BLOOD PRESSURE.
INTERRUPTED OR RED LINE = PULSE.
DOT AND DASH OR BLUE LINE = RESP.

C. T. Celiohysterectomy. Blood-pressure.

fell. At no time did it reach a point indicating shock or collapse.

The removal of the pelvic organs was chosen in this case because the operator believed that the patient's chance for uninterrupted general good health would be better after such a procedure than after any other. The proposition to leave the ovaries to avoid the disturbance of the menopause sounds attractive. In operating upon patients at term, the ovaries are so high in the abdomen and the normal relation so altered by the growth of the uterus that it is not an easy matter to leave the ovaries after the tubes and body of the uterus are removed. The removal of the pelvic organs leaves the patient with but two points of suture uncovered by peritoneum and in the best possible surgical condition to escape infection and hemorrhage.

In dealing with these patients we have never had serious hemorrhage during or after the operation. The placenta has been found under the line of incision on the anterior wall of the uterus above the lower uterine segment in fully one third of all cases. Its presence has not, so far as we have observed, made any difference to mother or child. In three cases the uterus

contracted sluggishly after the removal of the child, and iodoform-gauze was packed into the womb and the end carried through the cervix into the vagina. This gauze was removed the second or third day after the operation. In but one case was there injury to the uterine muscle during the extraction of the child, which made it necessary to remove the uterus, and this followed, as described, in the case of undeveloped womb with induced labor. While in the majority of cases the fœtal membranes have been ruptured before operation, in a number they have not, and this again has seemed to make no difficulty in the result. All patients are prepared for intravenous saline transfusion, although it has rarely been necessary. Cases infected before operation or greatly prostrated are always treated in this way. The time of operation is chosen, so far as possible, when the cervix is dilated to at least the circumference of a half-dollar, and pains are strong and regular. Even in cases where it is known that celiohysterectomy is to be done, we believe that there is better drainage from the stump if the cervix is partly dilated at the time of operation.

After-treatment. Should the patient be restless and complaining of pain, morphia $\frac{1}{8}$ grain to $\frac{1}{6}$ grain is given by hypodermatic injection; by mouth the patient receives sips of hot water only. Strychnia $\frac{1}{40}$ grain is given hypodermatically every six hours; by rectum the patient receives $\frac{1}{2}$ to 1 ounce of whisky and $4\frac{1}{2}$ ounces of salt solution every six hours. If the patient complains that the adhesive strips at the upper portion of the abdomen are tight, the head nurse nicks the upper strip at its upper edge, slightly, with scissors. If the patient is doing well, she may be turned very slightly on the side during the first night after operation. The catheter is used every six hours.

During the second twenty-four hours after operation the patient receives from one to two grains of calomel in divided doses, with small quantities of albumen-water. The hypodermics of strychnia and the rectal injections of whisky and salt solution are continued. If the mother is in good condition, the child is put to the breast during the second twenty-four hours, every four hours by day.

By the morning of the third day the patient's bowels are thoroughly moved by salines and high enema; after this the patient receives by mouth liquid food every three hours; strychnia $\frac{1}{40}$ every six hours. The rectal injections are often discontinued; the use of the catheter is stopped as soon as possible; the child is allowed to nurse every three hours during the day.

From this time on the patient's convalescence is that of the usual puerperal woman. Ergot is not given during the puerperal period, to avoid the danger of tearing out the uterine stitches through contraction of the uterine muscle. Iron, arsenic, and bitter tonics are given to the patient freely if her nutrition requires them. The diet is abundant, and consists largely of milk.

Where there is no rise of temperature, the stitches are often left for two weeks without disturbance; should, however, there be temperature indicating possible infection, the wound is immediately examined and infected stitches are removed; a second plaster dressing is placed upon the abdomen after the stitches are removed, and when the wound is firmly healed an abdominal belt is adjusted. In our experience no patient is fully convalescent after Cæsarean section before six weeks, and our aim, especially with hospital patients, is to keep them in the wards as long as possible; it is often difficult to do this, as patients feeling well do not understand why they cannot return to their work and their homes.

The Care of the Infant. For the first twenty-four hours after birth the infant receives five drops of brandy in two drams of water, every four hours. If the child is fretful, the intestine is very thoroughly irrigated with warm salt solution; if the child seems at all weak, it is kept thoroughly warm. If the mother's milk does not form promptly, the child is given, after each nursing, from one to two ounces of pancreatized dilute milk. If the mother can nurse the child entirely, artificial feeding is discontinued, but is frequently maintained at night. As soon as possible the child is put upon modified milk, in proportions depending upon its weight and size.

Summary. We may summarize the results of these cases as follows:

Uninfected before operation, 39; mortality, 1

(2.6 per cent); cause, peritonitis from bacillus proteus vulgaris; origin unknown; uterus healed, clean, empty. Morbidity of those cases uninfected before labor, 4; 1 celiohysterectomy, hæmatoma from wound in vessel of broad ligament, discharge through the vagina of silk stitch; 1 celiohysterectomy, partial necrosis of the stump, with discharge of stitch through the vagina; 1 celiohysterotomy, intentional infection by the patient of the line of incision during convalescence, resulting in fistula, which finally healed; 1 celiohysterotomy, skin infection following track of sutures, causing fistula, which finally healed.

Cases infected before operation, 6; recovered, 3; died, 3. Cases recovered: Porro operation, 2; celiohysterotomy, 1. Cases dying after operation, 1; celiohysterectomy, intestinal ulcers from bacillus coli communis, lymphangitis of abdomen, uterine stump sterile and healed; 1 uterine infection after prolonged efforts at delivery by forceps, with death of child, celiohysterectomy, patient exhausted; 1 peritoneal infection from tubal focus, resulting in lymphangitis, celiohysterotomy, uterus found healed and sterile. These cases all had thorough autopsies.

Morbidity in cases recovering, infected at the time of labor, 1; previous forceps application, celiohysterotomy, stitch abscess, about a year after operation abscess in abdominal wall, finally followed by the removal of the body of the uterus, tubes, and ovaries.

Operations done for eclampsia, 3; 2 antemortem, 1 post-mortem. These patients died; one child survived two weeks. All were operated upon as a last resort.

Total number of operations, 48; general maternal mortality, including eclampsia, previous infection, hemorrhage, and exhaustion, 12 per cent.

Children, mortality among those in good condition, fully developed before operation, none in 40 cases. Children dead before operation, 4. Children dying one month after operation: Prematurely born, anæmic, 1; dying from marasmus, with failure of assimilation, 1; dying of catarrhal pneumonia following influenza, 1; dying of toxæmia of pregnancy, 1. No child died during the operation or within 72 hours after its performance. No child was born severely asphyxiated after operation, although in the majority of cases respiration became established more slowly than after spontaneous parturition. In no case were prolonged efforts to establish respiration necessary, and no difficulty was found in bringing the children readily to breathe.

It has been impossible to follow these cases, with the majority of patients, after operation. They have been urged to return to us for examination, and many of them have done so, and have been found in good condition; but one patient had hernia, and that a slight ventral hernia, three years after the Porro operation.

We believe it to be advantageous to the patient that adhesions between the uterus and the anterior abdominal wall should occur during convalescence. This prevents retroversion, and should a second Cæsarean section be necessary, it will be less difficult and dangerous than the first. Should infection occur during convalescence, it will usually develop in the abdominal or uterine incision; if adhesion is present, abscess and fistula is the usual result of such infection without more dangerous complications. The general peritoneal sac is protected by such adhesion, and it is therefore desirable.

It seems reasonable to conclude that while this series of cases is not a large one when compared with those reported from foreign clinics, yet it still illustrates fairly what the American obstetrician may expect to deal with under the conditions existing in many portions of this country. The Jefferson Maternity, where most of these operations were done, is a small hospital, and the number of operations would seem greatly out of proportion to the number of patients admitted, were it not for the fact that beds are reserved, as far as possible, for those patients who especially need surgical care in labor, while from lack of space many normal cases are attended at home. Results of these operations indicate that delivery by abdominal incision in uninfected cases compares favorably, for mother and child, with induction of labor or other methods of delivery. In even the most desperate cases it does not add to the mortality of the critical conditions present. It must be remembered that the operation should be limited, if possible, to

cases uninfected before labor, where frequent vaginal examinations by dirty persons have not been made, and where no manipulation to deliver the patient has been attempted.

It will be noticed that the morbidity in these cases arose principally from infection from the skin. It was often impossible to secure sufficient time to sterilize repeatedly the surface of the abdomen; hence the risk of infection from cutaneous sources is much greater than in cases in which the operator has abundant time to prepare repeatedly the outer surface of the abdominal wall. In cases under observation for some time, where it is known that operation will probably be performed, there is usually time for adequate preparation.

JEFFERSON MEDICAL COLLEGE

Department of Gynecology

THERAPEUTICS OF RETRODISPLACEMENT

By E. E. MONTGOMERY, M. D., PHILADELPHIA

Professor of Gynecology in the Jefferson Medical College; Gynecologist to Jefferson and St. Joseph's Hospitals

IT may be considered that retrodisplacements and the methods of procedure for correcting them have been so frequently discussed that the last word has been said, but there is so great an uncertainty in the mind of the medical practitioner as to the best method of dealing with these conditions that I feel justified in attempting a *résumé* of the subject.

There is much diversity of opinion as to the symptoms and influence of retrodisplacements. My own experience leads me to assert that retroversion and retroflexion, *per se*, do not give rise to symptoms; that the symptoms which are generally attributed to them are the result of the complications. It is generally believed that a retrodisplacement of the uterus, whether version or flexion, interferes with the pelvic circulation, causing congestion, increased secretion, and the consequent leucorrhœa, backache, and other symptoms usually attributed to it. When we realize that the uterus weighs but three hundred grains, that it is well supplied with arteries, and much more abundantly supplied with plexuses of veins, so that if there is obstruction of some vessels the circulation is easily re-established through the collateral vessels, it is difficult to place so high an estimate upon the mere displacement.

That the symptoms usually attributed to the displacement are due to the complication is evident from the fact that retroversion and retroflection are not uncommon in cases where symptoms are absent. Thus, Schroeder, in the study of 411 patients, none of whom complained of pelvic symptoms, and the minority of them from abdominal symptoms, found retroversion or retroflexion in 118 cases, or 28.71 per cent. In the 411 patients, abdominal symptoms were absent in 303, while a retrodisplacement occurred in 79 of these, or 26.7 per cent.

It has also been found that where the symptoms were present as a result of complications, the relief of the complicating condition caused the disappearance of the symptoms, though the uterus retained its supposed abnormal position. The addition of the complication, however, usually brings about such changes that recovery is much more speedy and certain when the uterus is maintained in its proper position.

In deciding, then, upon the plan of treatment, it is important that accurate diagnosis should be made, not only of the existence of the displacement, but also of the complicating conditions associated therewith. In determining the diagnosis it should not be forgotten that many constitutional conditions, or diseased states of other organs, produce symptoms which have been attributed to displacement of the uterus, but which would exist were the

uterus in its normal situation. Thus, patients have been subjected to operative measures for the correction of existing displacements of the uterus when the individual was the victim of tabes dorsalis, paranœa, and chronic dementia. No more unpleasant experience could occur to an operator than to realize that he had subjected such a patient to a serious operation with only the result of adding to her discomfort.

The retrodisplacement of the uterus may be found associated with ptosis of the abdominal viscera, as the kidney, liver, large and small intestine, and stomach. The complications that are most frequently found, and which especially give rise to the symptoms attributed to retrodisplacement, are chronic endometritis, metritis, prolapsus, and chronic inflammatory diseases of the adnexa, together with inflammation of the peritoneum and cellular tissue.

With the recognition of the production of symptoms simulating those associated with disease of the pelvic organs produced by disorders of other portions of the body, the gynecologist should be very chary of operating upon patients in whom the uterus is freely movable and presents no evidence of inflammation in its structure or its adnexa, unless he is able to eliminate the possibility of the production of the symptoms by coexisting diseases independent of the uterus. The demonstration of complications in and about the uterus need not necessarily be considered as an indication for operative interference. Indeed, many patients were made comfortable and afforded relief prior to our present day craze for operative procedure.

The employment of suitable pessaries frequently served a useful purpose. This form of mechanical treatment, however, is difficult to carry out in an aseptic manner. The pessary, at best, is a foreign body. It must be accurately adjusted to the parts, and the uterus must be capable of being placed in its normal position before the introduction of the instrument. The pessary maintains but does not correct the position. It acts by traction upon the uterosacral ligaments, drawing the cervix backward, and consequently holding the fundus of the organ tilted forward. In addition to the inability to keep the vagina aseptic, the pessary tends to stretch the uterosacral ligaments while it is worn, and consequently, when withdrawn, lessens the support the uterus would have from its normal ligaments, and thus increases the tendency to recurrence of the displacement.

Where the displacement has existed for a length of time, both the anterior and posterior vaginal walls tend to become shortened, with obliteration of the posterior vaginal fornix. The introduction of the pessary in such cases subjects the mucous membrane to undue pressure, which may lead to early abrasion and laceration, developing cicatricial changes, which render the continued wearing of the pessary not only uncomfortable but dangerous. This treatment is not applicable to cases where the vagina is small and undilated, as in the virgin, nor to women in whom the perineal or pelvic support has been lost by laceration of the pelvic floor. The instrument, then, is unsuitable in chronic cases. It may be applied with advantage in individuals who have recently given birth to children, in whom the uterus is large and needs but to be maintained at a higher level until the process of involution can be completed, the ligaments being sufficiently strong to support a normal sized uterus and only deficient while it is large. A prime requisite, also, for its employment is that the uterus shall be freely movable and capable of being replaced to its normal place.

The use of the pessary, consequently, should not be advised where inflammation exists to such a degree as to lead to adhesions between the uterus and the surrounding viscera and thus prevent the organ from being readily replaced. Such patients, however, especially where the inflammatory complications are recent, need not necessarily be subjected to operative interference. The systematic employment of pelvic massage will, in such cases, exercise a useful purpose. The manipulation of the uterus promotes the absorption of the inflammatory exudate, the disappearance of adhesions, the setting free of the uterus, and its restoration to its normal position and relations. This treatment can be supplemented by the employment of medicated vaginal tampons, by which the uterus is raised, maintained at a higher

level, its circulation promoted, and its replacement gradually accomplished.

Such a plan of treatment not only promotes the absorption of the exudate about the uterus, but by the increased activity of the circulation decreases the size of the organ, and where the patient is able and willing to take the time, the inflammatory complications may be completely overcome and the uterus restored to its normal position. This plan of treatment, however, should not be employed where the possibility exists of pus collections, either in the pelvis, the tubes, or the ovaries.

When we come to consider the operative treatment we find an embarrassment of riches. As operative measures have been suggested for the treatment of retrodisplacements of the uterus from the time of Alquie in 1840 to the present date, one would suppose that every conceivable operative procedure had been suggested for the treatment of this condition, yet, doubtless, there are more to come.

As naturally might be conceived, the first operative measures were designed upon the round ligaments, securing their shortening without opening the peritoneal cavity through their exit from the inguinal canal. In the evolution of the operative measures upon the ligaments, the ligament is reached by incision over the external inguinal ring by direct incision into the internal ring, or the entire canal is opened. The ligament has been drawn out and the loop sutured, the superabundant ligament cut off, the ligaments carried beneath the skin over the abdominal aponeurosis and sutured or tied together and again sutured.

The operation for shortening the ligaments external to the peritoneum, as suggested by Alquie, devised by Alexander and Adams, perfected and modified by Edebohls, Newman, Martin, Goldspohn, and others, is applicable only to the cases in which the uterus is movable and free from perimetritic adhesions. Such adhesions are not always readily demonstrable, and, as a consequence, the uterus sometimes is drawn between two forces — the traction of the shortened ligaments, and that of adhesions between the uterus and rectum — or from the extremities of the Fallopian tubes. The limitations of the Alexander operation or its modifications naturally led to the opening of the abdomen. From this a crop of procedures resulted. The fixation of the uterus to the anterior ventral wall as devised by Olshausen, the securing of a ligament or suspensory ligament as planned by Kelly, and its various modifications, as the introduction of the urachus through a slit in the uterine fundus as suggested by Martin, or the urachus failing, a twist or roll of the peritoneum, as advocated by Bovée, has been largely employed and has had numerous advocates.

Ventrofixation or ventrosuspension has been found to be a procedure not free from objections. The uterus is drawn up to an unusual level; when secured by suturing just posterior to the line of the fundus it is placed in a rather markedly anteflexed position. The operator is not always certain as to the possibility of the degree of fixation which will result from the operation. A slight degree of infection may produce a firm fixation. Where a band of adhesion is stretched out, it allows considerable mobility, and affords no certainty as to how long the uterus will be maintained in the anterior position. The band of adhesion, at best, is a cicatricial one. It is, consequently, incapable of involution and evolution. It becomes a source of more or less discomfort during a subsequent gestation. The discomfort may be so great as to add greatly to the distress of the patient, or the fixation may be so firm as to limit the subsequent increase in size of the uterus, rendering it difficult, and cause a thinning of the posterior wall, which endangers rupture at the completion of the gestation or insures dystocia during delivery. Where the suspensory band is small, the stretching becomes so great as to increase the probability of recurrence of the displacement, should conditions be favorable for its redevelopment. The operation is not absolutely free from danger, as has been the experience of myself and others. A coil of intestine may push forward between the fixed uterus and the bladder, through the vesicouterine space, and become strangulated. In my patient death took place from strangulation of the intestine within less than twenty-four hours. The possibility of this lesion has induced the performance of vesico-ventrofixation, which consists in suturing the anterior surface of the uterus to the peritoneal surface of the

Fig. 1. Crescent incision, exposing aponeurosis.

bladder, continuing this suture upward until the fundus of the uterus is attached to the parietal peritoneum at the lower angle of the wound. This suture of catgut is supplemented by a through-and-through suture of silkworm gut, securing the fundus to the parietal peritoneum. The objection to this procedure is that the uterus becomes a more or less fixed organ, and its arc of mobility is greatly limited.

Vaginal operations have also been devised. These are performed through an opening into the anterior fornix of the vagina, displacing the bladder until the peritoneum is reached and the suturing of the uterus to the peritoneum and vagina without opening the former, the opening of the peritoneum, drawing down of the uterus and fixing it to the vagina, or securing instead a loop of the round ligaments for attachment to the vagina, or a flap of the vesical peritoneum is sutured to the fundus uteri, allowing the anterior uterine surface to become attached to the bladder. The vaginal operations, like the Alexander operations, are defective, in the fact that the separation of the adhesions and the treatment of diseased adnexa are rendered difficult through such an opening, and it is also difficult to secure and maintain thorough asepsis.

The employment of the round ligaments as stays to hold the uterus forward, as in the Alexander operation, very naturally led to the consideration of their employment after the abdominal cavity was opened, and presents the advantages of permitting them to be reached through a single incision and of affording an opportunity for the investigation and treatment of the complicating conditions within the pelvis, thus greatly extending the usefulness of such operative procedures. Here, again, is found a great variety of methods of procedure. The ligaments are folded in and folded out, carried forward and attached to the anterior surface of the fundus, so folded as to make them about one third of their usual length, one end of the loop sutured to the side of the uterus and the other to the point of exit of the ligament from the peritoneal cavity. A loop of the ligament has been carried through a slit in the anterior wall of the uterus, or through the broad ligament, and attached to the posterior, or the ligament has been cut, the distal end carried through the broad ligament, fastened posterior, thus swinging the uterus forward.

In all of these methods of procedure, however, the best portion of the ligament is taken up, leaving its weakest and least resisting portion — that which passes through the inguinal canal — undisturbed. This objection has been obviated in the Gilliam operation, in which a loop of the ligament is drawn through the abdominal wall and fastened upon the surface of the aponeurosis. Another danger was here

Fig. 2. Aponeurosis incised, showing recti muscles.

introduced, in that the anterior parietal space was divided into three channels, one on either side of the loop and the other between them, which increased the risk, already suggested in ventrosuspension, that a coil of intestine might slip through one of these openings, especially the lateral ones, and become pinched. Ferguson obviated this danger by closing the lateral opening within the peritoneum by a suture. Simpson carried the loop into the broad ligament and forward in front of the bladder.

I have combined the Simpson and Gilliam procedures by carrying the loop into the broad ligament and between its folds beyond the peritoneum, when it is brought through the abdominal wall and secured upon the aponeurosis. The steps of this procedure are seen in the accompanying illustrations. It has, in my judgment, the advantage that it supports the uterus by ligaments capable of evolution and involution. The organ is left freely movable. There are no points within the abdominal cavity for adhesions, or to endanger the strangulation of the intestinal coils. The operation may be performed through a vertical incision, but I prefer that devised by Pfannensteil and introduced in this country by Stimson of New York. With the patient in the Trendelenburg position, a curved incision parallel to the margin of the pelvis is made, generally within the hair surface, through the skin, superficial fascia, and

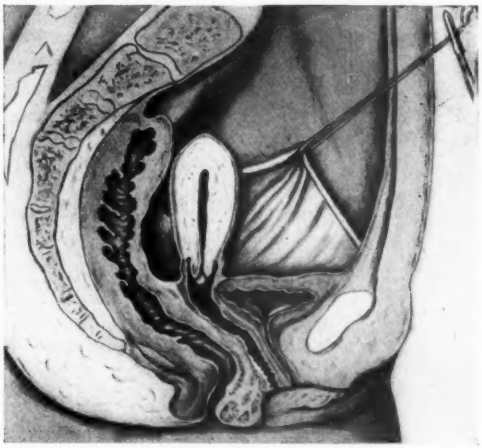


Fig. 3. Temporary ligature about round ligament.

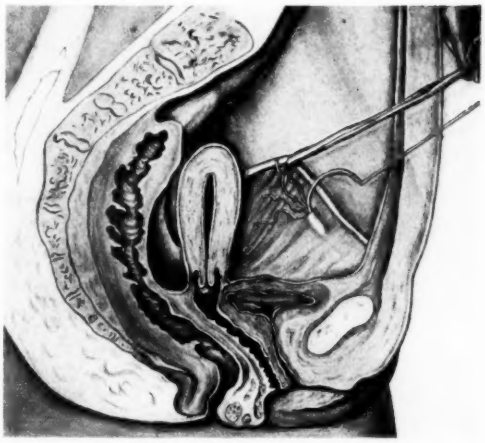


Fig. 4. Temporary ligature carried between folds of the broad ligament.

aponeurosis, the (Fig. 1) latter is drawn upward and separated from the pyramidalis muscles (Fig. 2), when the recti muscles are separated and the peritoneum divided vertically. This incision brings the operator directly over the uterus and the round ligaments, and the latter, one after the other, are lifted up and a catgut ligature passed beneath it, and the ends of the ligature temporarily secured by pressure-forceps. (Fig. 3.) The ends of one ligature are now threaded into the eye of a Dechamps needle, the round ligament secured external to the ligature with forceps, and a cut made with scissors in the anterior leaflet of the broad ligament, through which the needle holding the ligament is introduced and carried between the layers of the broad ligament (Fig. 4) until it reaches the parietal wall uncovered, when it is brought out upon the aponeurotic layer. This step in the procedure is greatly promoted by having the assistant keep the distal portion of the round ligament tense with the forceps which were applied upon it. Each ligament having been brought through the aponeurotic layer, the exit of the loop of ligament is facilitated by traction upon the ligature, while sharp-pointed scissors are introduced, closed alongside the tense ligature, and slightly separated as they are withdrawn. In the majority of instances their withdrawal is followed by the emergence

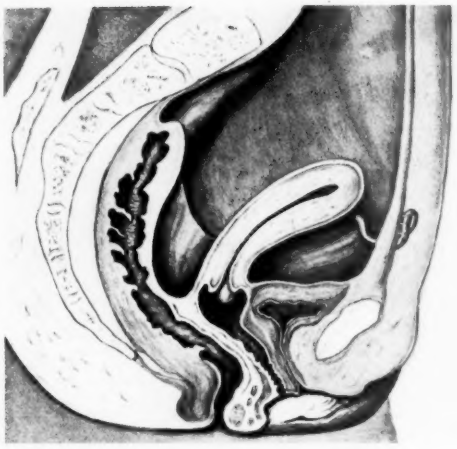


Fig. 5. Loop of ligament secured upon the aponeurosis.

of the loop. Where this does not occur it may be easily teased through with the aid of the scissors. The loops are secured with chromic catgut to the aponeurosis. The operation is very quickly done in uncomplicated cases, as I have frequently had the patient ready for the dressing within ten to fifteen minutes from the beginning of the incision. Neither this operation, ventrosuspension, ventrofixation, nor the Alexander operation is effective in prolapsus with relaxed or torn pelvic floor. The dependence upon such support would lead, necessarily, to the uterus dragging upon the ligaments or the suspensory band of adhesions which has been established, and the organ hangs as if it had been pinned up. In such conditions the operation must be associated not only with plastic operation upon the pelvic floor, with repair of injuries to the cervix or amputation of the cervix where the uterus is large, but it is also wise that the uterus shall be more firmly fixed across the pelvic outlet by either shortening the uterosacral ligaments or folding up the retrouterine pouch. Where the prolapsus has been long continued and the parts have become greatly stretched, the uterosacral ligaments are usually so spread out and atrophied as to be of little value, and, indeed, oftentimes difficult to demonstrate. The center of Douglas pouch can be secured with a double tenaculum and dragged up, the surfaces excoriated, or the peritoneum cut through, exposing the deeper structures, which can be sutured anteroposteriorly, thus lifting up and carrying backward the cervix. This, with shortening of the round ligaments, insures the uterus being maintained as a plug to fill up the pelvis and decrease the danger of hernia.

In conclusion, we would emphasize: 1. That the discovery of retroversion or retroflexion in a patient is not necessarily an indication for its treatment; 2. That the symptoms usually attributed to such displacements are due to the complications rather than to the displacement, and, consequently, these complications must be considered in deciding as to methods of treatment; 3. Ventrosuspension and ventrofixation during the child-bearing period should give place to suspension of the uterus by its round ligaments, and preferably by the combination of the Simpson-Gilliam operations which I have designated in this paper; 4. Dependence should not be given to the shortening of the ligaments alone, but the complicating endometritis, metritis, and relaxed pelvic floor should be combated by appropriate measures, in addition to the suspension described; 5. Prolapsus, in addition to the reduction in the size of the uterus by amputation of the cervix, by restoration of the pelvic floor and shortening of the round ligaments, should be supplemented, where necessary, by the shortening of the retrouterine structures.

JEFFERSON MEDICAL COLLEGE

Department of Surgery

THE TREATMENT OF TUBERCULOUS GLANDS OF THE NECK

By JOHN H. GIBBON, M. D., Philadelphia

Associate Professor of Surgery, Jefferson Medical College; Surgeon to the Pennsylvania Hospital and the Bryn Mawr Hospital

TUBERCULOUS disease of the cervical lymph-nodes is the most common variety of lymphatic tuberculosis. In its early stages it is, in nearly every instance, an entirely local process, responding to proper treatment in a remarkably satisfactory manner. The outlook for these cases, if prompt measures of treatment are instituted, is even more hopeful than in bone tuberculosis. The condition is nearly always primary, the lungs usually being free until very late in the course of the disease. When not treated by removal of the glands, lung, intestinal, and cerebral involvement is frequent.

The diagnosis of tuberculosis of the cervical lymphatics is not usually difficult. There has been a tendency, however, to consider all localized enlargements of the lymphatics as of tuberculous origin. A positive diagnosis should not be made until the glands have been removed and the characteristic macroscopic appearance observed. Occasionally, even this is not sufficient, and we must rely upon the microscope to differentiate tuberculosis from other conditions, such as Hodgson's disease. I have more than once been confident that glands were tuberculous and had a diagnosis of Hodgson's disease made in the pathological laboratory. There is a simple hyperplasia of the lymph-gland which is frequently mistaken for tuberculosis. The glands reach a large size, but no tubercle bacilli are found in them. The differentiation of acute tuberculous disease of the glands and lymphosarcoma is often quite difficult, especially in children. In nearly all of the conditions where the differential diagnosis is difficult, the treatment is practically the same, and a definite diagnosis can be deferred until an examination of the glands can be made.

It is the intention of this paper to deal especially with those cases requiring radical and thorough dissections of the neck. It is, of course, understood that the removal of all enlarged glands is not indicated the moment the enlargement is observed. We are all familiar with the acute glandular infections which quickly break down and form an abscess, especially in children. In such cases, radical operation is not required, the patient recovering promptly after the simple opening and treatment of the abscess cavity. If other glands are involved around the abscess, they usually disappear after the removal of the suppurating area. This does not always happen, however, the glands sometimes becoming chronically enlarged and requiring thorough and extensive removal. Many of these acute abscesses which occur in the cervical region are not of tuberculous origin, but are the result of non-tuberculous inflammatory conditions in the mouth and throat. Any inflammatory condition in the mouth or throat is apt to produce an enlargement of the lymph-glands of the cervical and submaxillary regions in the young, and with the proper treatment of the source of the infection the glands themselves rapidly resume their normal size and function. When a patient first presents himself with enlarged cervical or submaxillary glands, a careful effort should be made to determine, as far as possible, the source and character of the infection, a thorough examination being made of the nasopharynx, the tonsils, and the teeth. Of the non-tuberculous acute inflammatory enlargements of the submaxillary glands, bad teeth are the most frequent cause. In the tuberculous cases the infection usually makes its entrance through the tonsil, and the first glands enlarged are those in front of the sternocleidomastoid muscle at the angle of the jaw.

Having made a diagnosis of probable tuberculous disease of the cervical glands, the treatment divides itself into three parts — medicinal, hygienic, and surgical. In the *early* cases, when

the involvement is not extensive, and suppuration has not taken place, medicinal treatment, combined with the hygienic, should invariably be given a trial. There are but two remedies which I have found to be of any value in this early stage of the disease, and they are arsenic and the syrup of hydriodic acid, and I have a strong preference for the latter. The syrup of hydriodic acid is a form of iodide which can be readily taken without disturbance of the stomach, and it is remarkable how much the dose can be increased and how long the drug can be taken with impunity. In not a few cases in which it would seem that a radical operation was indicated, I have seen the glands gradually recover under this remedy, and it is always my custom to give it after operation. Of all the alteratives which have been employed in this disease, I believe it is the best. I want to emphasize, however, the fact that I use it only when the case is of short duration, where there is no immediate demand for operation, and then only for a limited time. If improvement seems to follow its use, I continue it. If after six or eight weeks no improvement take place, I advise operation. Too much stress cannot be laid upon the hygienic treatment, a factor too frequently overlooked by the surgeon. To allow a patient after operation to live a closely confined life in a bad atmosphere and to eat unwholesome food is simply to encourage a return of the trouble in other glands, with the necessity of repeated operation. With poor patients living in the city, who cannot afford to carry out the best hygienic treatment, it is my custom to send them to a farm in a healthful neighborhood, and make them lead an open-air life and eat proper food, chiefly eggs and milk. When the lungs, too, are involved, which is seldom the case, the patient should be put under the care of a medical man, who understands the hygienic treatment, as soon as convalescence from the operation is established. In many cases when the lungs are affected, operation is contraindicated. I wish to repeat that it is only in the early stages, when the glandular involvement is not extensive, and when suppuration has not taken place, that the combined medicinal and hygienic treatment is to be tried. In a large majority of the chronic cases there is little chance of recovery, unless the diseased glands are removed. Then if the hygienic treatment is properly carried out, increase in weight, with improvement in general health, takes place promptly. A large part of the improved results following operation during recent years is to be ascribed to the recognition, on the part of surgeons, of the great importance of carrying out the proper post-operation treatment. Another factor resulting in improved results is the fact that medical men have learned the fallacy of carrying these cases along on medicinal and hygienic treatment long after the period when they should be turned over to the surgeon for operation. Such delay only results in the extensive involvement of the lymphatics, with multiple points of suppuration and subsequent lung, intestinal, or meningeal involvement. When operation is thoroughly done and followed by proper hygienic treatment, these complications are practically never seen.

Should other glands become affected after operation, they should be removed as thoroughly as in the first instance. So long as one diseased gland remains with uninterrupted communication by means of the lymph-vessels with its neighbors, it is a constant menace to them. It is the universal experience of surgeons that there is always a more extensive involvement of the glands than would appear from inspection and palpation. This being the case, it is always wise to prepare for a thorough dissection of the neck.

The operation for the removal of these glands, in order to be successful, must be thorough. The frequency of recurrence bears an exact relation to the thoroughness with which the work is done. A few years ago, recurrence was the rule; now, after the complete operation, recurrence is comparatively rare. I have a number of cases which have gone for varying periods of years after operation on both sides of the neck, with no recurrence. It is a mistake to undertake this operation without a working familiarity with the delicate anatomy of the neck, and this familarity comes only after careful study and frequent dissection or operation.

The incision must be one which gives free access to all the involved area, and yet one which will result in the least possible disfigurement. It is remarkable how extensive an

operation can be done through an incision made in the natural creases of the neck; an incision which results in an almost imperceptible scar. When the whole neck is involved, the avoidance of scar is impossible, and occasionally, due to keloid development, the scarring is very disfiguring. It is a great mistake to lose sight of the most important feature of the operation, namely, the complete removal of all enlarged glands, in an endeavor to produce a good cosmetic result. We are dealing with a serious condition, and its complete eradication should be our prime object. For a long time the most generally employed incision was the one which passes down from the mastoid along the sternocleidomastoid muscle to clavicle and then outward above the clavicle as far as necessary. This incision gives an excellent exposure, but certainly does produce a very perceptible scar. An excellent method of exposure through the natural creases of the neck is described and illustrated by Dowd (*Annals of Surgery*, July, 1905). It consists of two incisions running across the muscle obliquely in the natural folds of the skin. I have used this incision with the most satisfactory results, but when there are many glands under the upper part of the muscle or in the posterior triangle, it becomes necessary to carry the upper incision along the posterior border of the muscle to a point about an inch inside of the tip of the mastoid process, as employed and described by Charles H. Mayo. When the submaxillary glands are involved, the incision should be made three quarters of an inch below the border of the jaw and parallel to it. If this incision is made too high, some of the branches of the facial nerve are sure to be cut. This incision, too, should not join the one made for the other glands, as the point of junction will be the site of an ugly scar. When both sides of the neck are involved, but one side should be operated upon at a single sitting. It is well to do the second operation in about ten days or two weeks. If it is postponed for any length of time, the remaining glands increase in size very rapidly. In attacking the glands themselves, certain structures are to be carefully avoided. Named in the order of their relative importance, they are the spinal accessory nerve, the facial nerve, the jugular vein, and the thoracic duct. The most frequently injured of these structures are the spinal accessory nerve and the jugular vein. The best way to avoid injuring them is to locate them early in the operation, if possible, before removing any glands. Certain of the superficial branches of the cervical plexus are invariably cut and areas of anæsthesia result, but they always disappear after a few weeks or months. The musculospiral may be identified by its position and by pinching it with forceps, when the trapezius will suddenly contract. Injury of the facial nerve is avoided by making the incision as described. The jugular vein is not infrequently injured, but the repair can nearly always be made with a lateral ligature. At one time injury of the thoracic duct was thought to be a very dangerous complication. Recent statistics show, however, that even if the duct is completely cut the patient does not die. In many cases it has been shown that the duct, upon emptying into the vein, divides into several branches, and it is probable that the operator often thinks he has divided the duct when in reality he has cut one of its terminals. A gauze drain passed down to the site of injury is the best treatment.

The closure of the wound should be done carefully and neatly, and, in most instances, drainage established for two or three days. It is seldom necessary to divide any muscle but the platysma, which, of course, is always cut in the primary incision, but if for any reason the sternocleido or other muscle has been divided, it should be sutured with gut. The platysma should be approximated with a continuous suture of gut and the skin closed with a subcuticular suture of gut or silkworm-gut. In closing all incisions in the face or neck, it is well to put in a subcutaneous suture before inserting the subcuticular suture, else the scar will later spread and make an ugly cicatrix. It is a good plan to prop these patients up in bed as soon as they wish, even on the day of operation, and to get them out of bed in a few days. When this plan is followed, there is much less subsequent stiffness of the muscles, due to adhesions.

JEFFERSON MEDICAL COLLEGE

Department of Obstetrics

LACERATIONS OF THE CERVIX UTERI

By STRICKER COLES, M. D., Philadelphia

Associate in Obstetrics, Jefferson Medical College; Assistant Obstetrician to Philadelphia and Jefferson Hospitals

IF any one will look up the literature on lacerations of the cervix, a large number of papers will be found devoted to secondary repair, removal of cicatricial tissue, amputation of the cervix, and some authorities will be found that add operations for cancer of the cervix.

These operations are demanded as a result of lacerations occurring during labor, which have not been prevented or properly treated. The question may be asked, What are the obstetricians doing to prevent this common and deplorable state of affairs? Some have gone on record as advising us to allow nature to take care of the tears, and should they not heal, to perform a secondary operation; others advise waiting for five days; and a third class, which seems to be in the minority, advises repair of the laceration at once. All authorities agree on immediate repair, if there is hemorrhage from a torn artery.

In every woman having a full-term child, there is more or less laceration, the extent of which depends on the efficiency of the bag of waters and whether the cervix softens, obliterates, and dilates before the advent of hard labor pains and expulsion of the child. Before the child is delivered, the cervix should be completely dilated, when the bag of waters is intact and pouching well, sedatives given — chloral, bromides, morphia, or chloroform — to allow time for dilatation. Should the bag of waters rupture prematurely or not pouch well, introduce a funnel-shaped rubber bag of sufficient size to produce complete dilatation.

When it is necessary to perform version or apply forceps before complete dilatation, deliver slowly, shoving cervix up over presenting part and dilate with hand; try to deliver through the cervix as high up in vagina as possible, for if cervix is dragged down low into vagina, it will not have room to dilate and will be badly torn.

The cervix just after labor is greatly elongated, being from two to three inches long. The anterior lip can often be readily seen just inside the vulva, and by sweeping the finger around the vaginal vault the location and extent of laceration can readily be determined. They will usually be found on one or both sides, rarely in the anterior or posterior lips. During the first twenty-four hours following labor the cervix retracts from one to one and a half inches, which lessens the tear to about one third of its original length. If the raw surfaces are left open, nature, to prevent the entrance of bacteria, throws out a wall of lymph, and the surrounding tissue will become infiltrated and the wound will heal by granulation and cicatrization.

All lacerations of one half inch or more should be closed immediately after labor. An exception may be made in badly neglected cases, when from pressure or violence the tissue of the cervix has been devitalized and is likely to become necrotic. This condition will not be seen in properly conducted cases of labor. The objection often made to the immediate operation is that a large number of cases heal spontaneously. When the tear is less than one half inch it will heal, but not often when it is longer, as shown by the large number of secondary operations done during the last twenty years. How does the tissue of the cervix differ from that of the rest of the body? If there were a like tear anywhere else it would be closed.

Another objection made is, that the lumen of the cervix is contracted by sutures to such an extent that the lochia is retained, causing subinvolution of the uterus. This should not be the case if the sutures are properly placed.

The cervix after closing should be as large as it was when dilated before the tear.

The objection to waiting four or five days is, that it can be closed at once with good results. A second operation is not necessary, and there is not left the raw surface for entrance of infection, and the soft fresh tissue is more readily closed than the hard infiltrated tissue. The number of cases under observation in which complete histories were kept in the Jefferson Maternity and in private practice is 2,200, and the immediate closing was done in 181 cases. One in about twelve required immediate closure. All cases recovered, and there was normal temperature in all but eight, and in six of these the temperature rose above 100°, but not above 103°, and fell to normal when the bowels were opened. In 2, the temperature remained between 102° and 104° for three days, gradually falling to normal without any local treatment. The stitches were not infected in any of the cases. In 2 cases there was no union; 1 of these was a hypertrophied cervix partly out of the vulva. In 20 cases the union was fair, and in 159 the union was good.

The method employed in most cases was, first, to pack the uterus with iodoform-gauze, which was removed after the closure, or left in for 36 to 48 hours. The cervix was grasped with tenaculum-forceps through both lips, or in later operations simply with the hand and held to one side, the index finger placed in the tear, the thumb and middle finger on each side. A curved needle armed with ten-day chromicized catgut is guided along inside of thumb, to prevent catching the vagina, to the uppermost part of tear, and carried down to but not through the mucous membrane. The needle is then guided by the index finger across the tear to opposite side, and the middle finger protects the point at its exit, when it is grasped by the needle-holder. The suture is then tied and examined to see that it is placed high enough, and should there be an opening above, another is placed higher up. Two sutures are usually enough, as the lower suture must be one quarter of an inch above lower border of the cervix, and the sutures must be placed a half-inch apart, as the retracted cervix will bring them closer together.

When the cervix is torn on both sides, each side must be closed. The sutures will not become loose when the cervix retracts, as the diminution is in length and not in thickness.

The after-treatment consists in keeping external parts clean by irrigating with mild antiseptic solutions and wearing sterile pads over vulva. Vaginal douches should not be used during puerperium. One douche of one-per-cent lysol may be given before or just after the operation. The sutures do not require removal, and should they remain a few days longer, their retention will not inconvenience the patient.

CONCLUSION

From experience in 181 cases of immediate closure of cervix, good union was obtained in about 88 per cent, fair union in 11 per cent, and no union in about 1 per cent. The position and involution of uterus was improved by the operation. There was no case of infection that could be attributed to the sutures, and operation did not cause the patient any inconvenience. Would the danger of infection be less if we left this tear open for five days or two months? and would the health of the patient be as good as with the immediate closure?

JEFFERSON MEDICAL COLLEGE
Department of Gynecology

RELAXATION AND ATONY OF THE NON-PUERPERAL UTERUS INCIDENT TO DILATATION AND CURETTAGE

By F. HURST MAIER, M. D., Philadelphia
Assistant Demonstrator of Gynecology in the Jefferson Medical College, and Assistant Gynecologist to St. Joseph's Hospital

KOSSMANN, some years ago, reported, in the *Zeitschrift für Gynäkologie*, two cases of uterine paralysis occurring in curettage of non-puerperal uteri. Strassman, in a paper published later in the same journal, vigorously denied the possibility of uterine paralysis occurring in the non-puerperal uterus, and declared that Kossmann's cases must have been perforations. In a closing publication, Kossmann maintained that his cases were those of uterine paralysis, and gave his reasons why it was possible for uterine paralysis to occur in a non-puerperal as well as in a puerperal organ.

In a dilatation or curettement of the uterus, one has but to measure the uterine cavity immediately before and after dilatation has been complete, or following the first few scrapes of the curette, to convince himself that a change in the size of the organ has taken place. In most cases an increase of from 1 to 2 cm. in the length of the cavity occurs. This phenomenon is due to a tone alteration (tonus wechsel) of the muscle. The relaxation is a response to the irritation caused by the introduced sound, dilator, or curette. Schaeffer, however, regards it as being entirely due to the forcible dilatation of the internal os uteri. According to Schaeffer, there are two stages of this tone alteration of the muscle. In the one, responding to the irritation produced by dilatation of the internal os, the uterus enlarges, assumes a balloon-like appearance (Ballonartige Auftreibung of Schaeffer), with relaxation of the walls and distention of the cavity. The walls during this stage, although relaxed, preserve their tense elastic consistency, that offer the usual resistance to the sound or curette. Here there is a condition of diminished muscle tonus, whereas in the other, with entire loss of tonus, there is a complete relaxation and stretching of the uterine muscle. The organ becomes a thin-walled, air-distended, flaccid sac, whose walls have lost their elasticity, and offer no resistance to the impinging instrument. This is the condition of complete atony — the uterine paralysis of Kossmann's and Strassman's controversy. Since this discussion, a number of other articles relating to this subject have been published, the most important ones being those of O. Schaeffer and Catharine van Tussenbroeck. Their investigations have unquestionably demonstrated the right of Kossmann's contention, that "atony may occur in a non-puerperal as well as in a puerperal uterus."

van Tussenbroeck, in her first paper, pointed out that there was nothing in the anatomy or physiology of a normal uterus to prevent atony. In her second paper, to support her clinical experiences, she gives a very plausible interpretation of how it is possible for enlargement of the organ to occur in connection with relaxation. As she pertinently remarks, "relaxation of a muscle, in itself, does not constitute increase in its length." She rejects, with good reasons, Doleris's and Geyl's interpretations. The former ascribes the distention of the cavity to the stretching of the relaxed muscle by the impinging instrument; the latter, to the entering fluid or air overcoming not only the passive resistance of the musculature, but intra-abdominal pressure as well. She agrees with Schaeffer concerning the physical appearance — balloon-like enlargement — of the uterus in the first stage, but not with his theory, "due to the irritation, there is a muscle movement (Muskle Verschiebung) with a thickening of the musculature at the fundus, with coincident thinning and stretching in the region of the internal os"; a mechanism analogous to that occurring during labor. Her own explana-

tion of the phenomenon is as follows, and is based partly on Schaeffer's own studies. In his work (*Wechselender Tonus der Gebärmutter auf intrauteriner Reize*), Schaeffer states that it is never alone motor, but a combination of motor and vasomotor influences. Furthermore, in his investigations (*über Experimentelle von den Innern Genitalien Auslösbarer Reflektorische und Koordinierte Fernerscheinung besonders des Blutegefässsystems*) he shows that artificial dilatation of the internal os of a non-puerperal uterus not only causes a local afflux of blood, but a general increase in blood-pressure, with increased pulse-rate, as well.

Accepting that this tone relaxation of the afferent vessels occurs coincidentally with the tone relaxation of the musculature, we have, then, an increased blood-supply in the relaxed uterus. Following this, we have the many tortuous vessels, both large and small, of the organ straightening out from the increased blood-pressure, and carrying the relaxed muscle with it. The atelectatic spaces (Kieffer) are filled with blood. The whole uterus swells and straightens up like an erectile organ. The cavity is distended and the walls retain their elasticity. If the tone relaxation of the vessels and the muscle remain entirely co-ordinated, the phenomenon will end as it began, simultaneously. The congestion disappears and the muscle contracts. The uterus is again in repose. Should there, however, be inco-ordination, which is possible, where the irritation is artificial instead of physiological, the congestion can disappear before the muscle regains its tone. With the disappearance of the former the uterine wall loses its tension, but the expansion remains, and the condition becomes one of complete atony. Before the publication of Kossmann's paper I was familiar with the fact that uterine atony not infrequently occurred during the curettage of puerperal uteri. I remember a number of cases, of which the following history is a type.

CASE 1. Mrs. J. W., aged 36, multipara. Curettage for retained secundines two weeks after a four months' abortion. Suddenly, in the midst of the curettement of the anterior wall, the instrument entered the cavity of the uterus a distance of 20 cm. I stopped curetting, as I felt sure of having perforated the organ. I did not withdraw the curette, but, placing my hand on the abdominal wall over that region, I immediately felt the wall contracting on the end of the instrument. Feeling sure that I had no perforation, but that the condition was one of uterine atony, I proceeded with the curettage. The patient made an uneventful recovery.

No thought of its occurrence in the non-puerperal uterus had at this time entered my mind. While it is true that I had experienced instances in which the curette had suddenly entered the canal to an unusual depth, I invariably ascribed them to accidental perforations of the organ. Since then I have been able to demonstrate to myself and others this tone alteration with relaxation of the uterine muscle during dilatation and curettage, as well as the occasional instances of the entire loss of muscle tone with complete atony, as the following histories will illustrate.

CASE 2. Mrs. L. T., aged 30, i-para. Suspicion of abortion some months before. Irregular, scanty menstruation. Profuse yellowish discharge. Uterus in good position, mobile, and somewhat enlarged. Cavity measured 9 cm. While curetting the tissue in the right uterine horn, the wall suddenly relaxed, allowing the curette to enter a distance of 15 cm. before it again came in contact with the wall. I explored the rest of the cavity to determine if it had participated in the relaxation, and although it was distended, yet not so to the same extent as the sacculated right uterine horn. This, undoubtedly, was a case of partial atony of the organ.

CASE 3. Mrs. H. K., aged 39, ii-para. Menstruation regular, very profuse, lasting nine to ten days. The uterus was in a normal position, mobile, firm, and somewhat enlarged. The cavity measured 8 cm. in length. During the curettement a condition of complete atony occurred, in which the curette entered a distance of 13 cm. After satisfying myself that no perforation had taken place, and that the uterus had contracted, I finished the curettement.

A second relaxation occurred, which I verified with the uterine forceps, as I was forcibly pushing a piece of gauze through the already contracted internal os, a small submucous fibroid was discovered in the wall of the body.

CASE 4. Mrs. M. W., aged 33; no history of ever having been pregnant. Uterus retroverted; chronic endometritis and metritis; chronic inflammatory mass of the left tube and ovary. Length of cavity, 7.5 cm. After the first few scrapes of the curette, complete atony occurred. The curette entered the uterine cavity a distance of 12 cm. Following the curettement I made an abdominal section on this patient. There were no evidences of injury to the uterus.

CASE 5. Mrs. L. B., aged 28, i-para. Menstruation very scanty for the past six months, at which time she

had had a four months' abortion. Purulent discharge. Uterus mobile and subinvoluted. Length of cavity, 9 cm.

During the curettement, a large piece of organized placental tissue was removed, and this was followed by sudden atony of the uterus. The instrument entered a distance of 15 cm. At first I thought perforation had taken place, but careful examination with almost immediate contraction of the organ convinced me to the contrary. Patient made a good recovery.

From my own experience, I, too, am convinced that uterine atony is possible in a non-puerperal as well as in a puerperal uterus, although it is not nearly so frequent; nor is the enlargement so pronounced in the former as in the latter.

The question arises, too, if some definite pathological change in the uterine wall is not a necessary prerequisite to bring about this phenomenon in a non-puerperal organ; a condition that leads to an inco-ordination of the tonus relaxation of the vessels and muscle.

In conclusion, I may say that this subject is not one of scientific interest alone, but it is of eminent practical value as well. As our literature contains little or nothing concerning it, I cannot help but feel that a paper of this kind is most timely.

Dilatation and curettage is probably one of the most frequently performed of all operations. For this reason it is well to bear in mind the changes that may take place in the organ at this time, and to be on guard against possible perforation when a state of atony is present. I feel assured that this condition has frequently been mistaken for perforation, with great harm to the patient. In the midst of the operation the curette slips into the uterus a distance of 10, 12, or 15 cm., and the operator, feeling sure that perforation has taken place, refrains from further interference. The patient has undergone a surgical operation that is unsatisfactory to the surgeon and of no value to herself.

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JEFFERSON MEDICAL COLLEGE

Department of Obstetrics

REPORT OF THREE CASES OF ECLAMPSIA RECOVERING WITHOUT DELIVERY

By COLLIN FOULKROD, M. D., Philadelphia

Instructor in Out-patient Obstetrics, Jefferson Medical College; Assistant Obstetrician, Presbyterian Hospital Maternity

WE present the record of these few patients as evidence of the fact that certain selected cases of eclampsia can be relieved either wholly or partially without rapid and forcible delivery; still further, that such treatment offers as good, and in certain cases better, opportunity for both mother and child.

Case 1. Mrs. M. G. G., white, Irish, primipara, 38 years of age, was received at the Maternity in an unconscious condition, June 3, 1906.

It was afterward ascertained that there was nothing in her family or previous personal history bearing upon the present trouble, excepting a vague history that in July, 1905, before present pregnancy, she complained of pains in the back, nausea, headache, and disturbed vision, which she attributed to kidney disease. Her menstrual history normal; the last sickness in November, 1905.

During the present pregnancy we find that she had suffered with severe headaches, was very restless, and that the kidneys were inactive. For the five days prior to admission she had suffered, without seeking medical advice, with excessive headaches; at twelve, noon, June 3, 1906, she had a severe attack of nausea and vomiting; at 1 P. M., developed her first convulsion, having three before 3 P. M., with no period of intervening consciousness.

On admission, she was unconscious; extremely restless; pupils a pin-point; skin hot, dry, suffused; foul breath, with vomiting of bilious fluid; a pulse fairly rapid and of not very full tension; lungs clear and heart strong.

Treatment instituted as follows: Hot pack for one hour, during which time the pulse tension rose considerably. While in the pack she received a hypodermic of veratrum viride, 10 minims; stomach was washed out with salt solution 1 gallon and calomel 10 grains, introduced through the tube. Bowels were then irrigated. The catheter revealed an empty bladder. The coma became deeper, and three successive convulsions were checked by the use of chloroform. At 8:30 P. M., blood-pressure rising, 5 ounces of blood were withdrawn, and 1½ pints of salt solution introduced into the same vein. Codeine ½ grain and atropine 1-100 grain were given by hypodermic. Bowels again irrigated, and patient catheterized without obtaining any urine. Vaginal examination revealed no dilatation or obliteration of cervix. It was decided not to interfere with child. Enema of salt solution 8 ounces, whisky 2 ounces, were given every third hour. Water by mouth, through pipette.

June 4, 1906, at 3 A. M. Patient began to show signs of returning consciousness, and at 8 A. M. was able to understand and answer questions. The pulse was full and heart action strong. During the morning hours she again received a hot pack, hypodermoclysis of salt solution 1½ pints. At 4 P. M., June 4th, she was quite conscious; drank 2 ounces of peptonized milk. During the ensuing night she received salt solution by the bowel, nitroglycerine 1-100 grain by the mouth, peptonized milk 2 ounces, and water 2 ounces, every four hours.

June 5, 1906. Pulse soft; retained nourishment; conscious; general eliminative treatment continued. The patient continued in good condition from this date.

Labor began early June 12th, and after a normal time she was delivered of a still-born female child weighing 2 pounds 14 ounces, 37½ cm. long. The pulse tension rose from 160 to 175 just before onset of labor, but dropped to normal after delivery.

The patient experienced a normal convalescence, and was discharged in good condition July 1, 1906.

Urine Examinations. These were made as soon as any could be obtained, and are reported as follows: June 7th, specific gravity, 1,003; acid; no albumin; urea, .4 per cent; no casts. June 8th, specific gravity, 1,004; alkaline; trace of albumin; urea, .4 per cent; no casts. June 18th, specific gravity; 1,010; alkaline; marked trace of albumin; urea, .8 per cent; no casts. June 25th, specific gravity, 1,010; alkaline; trace of albumin; urea, 1.2 per cent; no casts. July 2d, specific gravity, 1,011; acid; faint trace of albumin; urea, 1.1 per cent; no casts.

Case 2. Mrs. L. McG., white, American, 41 years of age, with nothing in her family, personal, or menstrual history bearing upon the present condition; had aborted at three months, February, 1905, making a good recovery. Her last menstrual epoch occurred April 15, 1905.

December 26, 1905. The patient was found at her home in a semiconscious condition, unable to see or speak. She had been feeling badly for some time, having headaches and general lassitude. On the morning of the 26th, she began to suffer from blindness and dizziness. At 9 A. M. she had the first convulsion; then again at 10:30 A. M., 1:20 P. M., and 2:30 P. M. On entering, the skin was dry and parched; pupils dilated;

pulse strong, full, and tense; feet and legs œdematous; fœtal heart sounds heard on right side of abdomen.

On entering the Maternity, the fifth convulsion was controlled with chloroform; she was given 5½ grains of calomel; hot pack from 4:05 P. M. to 4:50 P. M., in which she had a sixth convulsion, easily controlled by anæsthesia. Hypodermic of veratrum viridi 10 minims, and bled from left arm; 4 ounces of dark blood removed, and ½ liter of salt solution introduced in the same wound.

Bowel irrigated at 6:05 P. M., with normal salt solution. At 7 P. M. the stomach was washed out and 5 grains of calomel, introduced through tube; vomited this later.

Second hot pack at 9:15 P. M., relieving the pulse tension somewhat. A grain of the mild chloride every thirty minutes until five grains were given. Later in the night, patient voided urine, and had a fairly good bowel movement, sleeping some few minutes, at intervals; peptonized milk given at three-hour intervals.

Morning of December 27th, patient seemed much better; sight returning; œdema of legs and feet disappearing; pulse softer, but still full; temperature 98⅘°; pulse 110; respiration 20.

Upon the afternoon of admission, a vaginal examination revealed a small, firm cervix; at that time, some few uterine contractions began, but ceased. It was decided not to interfere with the natural delivery of the child at this time.

December 28, 1905. Temperature 98°, pulse 110, respiration 20, at 6 A. M. Patient slept some during night. Bowels irrigated every fourth hour with normal saline solution; peptonized milk at three-hour intervals. Pulse slightly more tense in the morning, and a hot pack given at 11:30 A. M. for forty-five minutes. Because pulse tension increased even in pack, hypodermic of veratrum viride, 10 minims, given; immediately modified the tension. During pack, patient vomited excessively; stomach washed out with normal saline solution.

December 29, 1905. In the afternoon, temperature 98⅘°; pulse 92; respiration 24; vomited considerably; pulse tension rising; another hot pack given for thirty minutes; veratrum viride 10 minims, given hypodermically while in the pack; calomel and purgative produced liquid bowel movement; slept a trifle toward morning.

December 30, 1905. Temperature 98°; pulse 98; respiration 22; patient vomited but little, and that just following rectal irrigation. Slept at intervals during day; vomited considerably during night. Bowels moved at 2 A. M.; slept between 4 and 5 A. M. Liquid nourishment.

December 31, 1905. Temperature 98°; pulse 110; rested well all day; diet increased.

January 1, 1906. Pulse 100, soft and compressible; skin moist; slept at intervals; good bowel movement at 2 P. M. Had slight bloody discharge. *Examination:* Heart sounds of fœtus heard in left lower quadrant; cervix back and to the right; no perceptible dilatation; no contractions.

During afternoon of January 1st, patient began labor pains; cervix dilated, and a flow of water indicated some leakage of amniotic fluid. Cervix dilated fully, and then progress seemed to be arrested. Forceps then applied and child extracted at 5:30 P. M. Hypodermic stimulation and ergot given under ether. Patient recovered well from anæsthesia. Baby strong and active.

January 3, 1906. Temperature 98⅘°, pulse 128, in the morning. Evening record, temperature 99⅕°; pulse 120, soft and firm; skin moist; bowels not moved, but voided urine; patient rested well; no signs of convulsions or stupor. Baby apparently healthy.

Both mother and baby passed through normal convalescence, and were discharged February 2, 1906.

Urine Examinations. December 26, 1905: Specific gravity, 1,022; acid; albumin very abundant; urea, .3 per cent; hyaline and granular casts. January 1, 1906: Specific gravity, 1,015; acid; large amount of albumin; urea, .7 per cent; hyaline, fine worse granular casts. January 7th, 1,018; abundant albumin; urea, .6 per cent; no casts.

It will be noted that at 4:15 P. M., December 26, 1905, the patient had her sixth convulsion; that this was the last convulsion;. and that from that time until January 1, 1906, the patient steadily regained her normal equilibrium as to consciousness and excretory functions, being practically over the eclampsia when labor came on.

CASE 3. Mrs. M. S., primipara, 18 years old, white. Previous history has no bearing upon present condition. Menstruation regular; last seen June 15, 1904.

On April 9, 1905, patient was admitted to the Maternity, having had three eclamptic convulsions prior to that time. She gave a history of severe frontal headache for some days, dryness of skin, constipation, and scanty urine. Pulse tension found to be very high. She was immediately put into a hot pack; stomach washed out, and calomel, 10 grains, introduced, which was vomited; 5 grains of calomel then given by the mouth, which also was vomited. Six ounces of blood removed from the median vein, this followed by saline transfusion of a quart of normal solution. A purgative enema with good result, followed by copious saline bowel irrigation. Pulse tension rose again, and veratrum viride, 10 minims, given by hypodermic. By the morning she was much better, having reacted well to treatment. Stomach again washed out, and two ounces of saline purgative introduced, which she vomited. Calomel ¼ grain at frequent intervals, followed by magnesium sulphate in small doses every hour, resulted in good bowel movements. Hot packs were given at intervals of six hours.

Patient had rapidly improved, having had but two convulsions the day of entrance and none since, was able to take liquid nourishment, and excretory organs acting properly, having in a great measure recovered from the eclamptic storm.

April 11, 1905. At 1 P. M., labor pains began, and at 4:35 P. M. she was delivered of a male child weighing 4 pounds 3 ounces.

April 14th. Patient resting comfortably; bowels regular and urine increased; some general œdema, due to decrease of vascular tension.

April 17th. Child died; mother much improved.

April 24th. Examination at discharge, involution of pelvic organs excellent.

Urine Examinations. April 10, 1905: Specific gravity, 1,024; acid; distinct trace of albumin; urea, .6 per cent; many hyaline and granular casts. April 17, 1906: Specific gravity, 1,022; acid; faint trace of albumin; urea, 1.2 per cent; few hyaline and granular casts.

The above detailed record of the expectant, eliminative treatment of these three patients is presented that we may illustrate the possibilities of such treatment in certain selected cases of eclampsia, keeping in mind that nature's method of delivering the child is by far the safer, if the existing conditions can be relieved by other means.

The cases are from a series covering two years' experience in Jefferson Maternity, in which time the same treatment was instituted in other patients of the same type. In some instances the giving of one or more hot packs brought on labor, and the early expulsion of the fœtus prevented our determining what had relieved the patient; in others the child was born before entrance; and in still others the patient was moribund when received, in one instance calling for a Cæsarean section on a dead mother. We have yet to feel that in any case in which we delayed immediate delivery such delay was in any measure responsible for any more serious illness in either mother or child.

In these three instances the mother recovered from the eclampsia, and active treatment had ceased before labor came on. In one, the child was born healthy and is still alive; in another, the child was born living and died in a few days; in the remaining instance the child was still-born.

INSIDIOUS AFFECTIONS OF THE KIDNEY IN THE YOUNG[1]

With Direct Bearing on the Prenatal Origin

By ROBERT GILLMORE, M.D., Chicago, Illinois

NOTWITHSTANDING the exhaustive investigations on the ætiology of various forms of nephritis in pregnancy, the subject is no nearer a solution at the present writing than it has been in the past. The causation of uræmia and eclampsia is supported by theories, not by scientific facts, and while speculation is of interest, it is not the intention of the writer to touch upon any of the well-beaten hypotheses bearing on this subject.

The extent to which the kidneys of the fœtus in utero may be damaged by the mother, who is suffering from any of the numerous forms of nephritis during her pregnancy, resides, at this date, in a comparatively unexplored country. In spite of Ballantyne's singleness of purpose and eloquent pleas, the literature on the subject is meager. There are, fortunately, many instructive cases which point with unmistakable clearness to the conclusions arrived at by the writer.

Brill and Libman (1) call our attention to a very common occurrence which has frequently been observed: a so-called "family nephritis." They quote a number of foreign observers who have reported undoubted cases of acute and chronic nephritis in the young. The diagnosis in not a few of them has been confirmed by post-mortems and pathological sections. The cases mentioned were found indiscriminately among both sexes, and ranged from twenty years to six months. They call attention to Dickinson (2), who traced a remarkable tendency toward forms of Bright's disease in three generations. In the first generation, three members of the same family suffered with albuminuria, and died at the ages of 34, 49, and 48 years; in the second generation, albuminuria developed in two members of the family at 12

[1] Inaugural thesis, read before the Chicago Gynecological Society, June 19, 1906.

and 16 years of age, and they both died before the age of 30 years; while in the third generation 5 out of 6 children developed albuminuria at 6 and 9 months, 13 years, and early boyhood. Tyson's case (3) is mentioned, where the mother died of nephritis at 60 years. The nephritis was diagnosed after one of her confinements. Of her 12 children, 6 died of kidney disease, and nephritis was diagnosed in 2 of the other 5. Two of her grandchildren suffered with nephritis. It is impossible for us to read over articles by other observers, among them Joseph Kidd (4), without being impressed that something more than mere "family nephritis," or a "peculiar tendency to inherit forms of nephritis," will account for the prevalence of kidney diseases in certain families. Moreover, the term "heredity" is extremely confusing, as well as misleading, if, as the writer believes, the lesions in the fœtal kidney occur because the toxines in the nephritic mother have damaged the kidney of her fœtus after conception has taken place.

There are several important pathological investigations from posted fœtuses of eclamptic mothers (5) which are identical in results with those the writer is able to present.

Literature supplies us with many facts which prove that both drugs and other poisonous materials may be carried to the unborn child from the maternal vessels. Iodide of potassium (6) appeared in the urine of a fœtus forty minutes after it had been given to the mother. The consensus of opinion is that opium and salicylates (7) affect the fœtus to a more or less degree when taken by the mother. Lead (8), phosphorus (9), calcium and sodium hypophosphite (10), and mercury (11), are communicated to the fœtus by administering it to the mother.

Methylene blue, given to the mother in labor, has been found in the urine passed by the newly born infant (12). A. Dienst (13) injected methylene blue into the placental vessels immediately after labor in 24 cases. In 15 labors he was unable to obtain the blue stain in the mother's urine, but in 9 he was able to do so. Of these 9, 7 developed eclampsia, and the other 2 suffered with albuminuria of a marked type. In these last 9 cases, we certainly have evidence that the maternal placenta, under certain conditions, was peculiarly permeable, and that there was a direct communication between the maternal and fœtal circulation.

We have undeniable evidence that it is possible for the mother to affect her fœtus with syphilis (14). We have authentic records of an unborn fœtus contracting typhoid (15). Cultures taken from the various internal organs of the fœtus at full term, at 3, 4, 5, 6, and 8 months, have grown typical Eberth bacilli. A pneumococcus (16) infection of the lungs of the fœtus has been demonstrated, by more than one authority, to have occurred during antenatal life.

It has been estimated that fifty per cent of infants born of mothers vaccinated during their pregnancy (17) are not susceptible to vaccination for six months after birth. Pertussis (18), measles (19), malaria (20), acute rheumatic fever (21), scarlet fever (22), smallpox (23), tuberculosis (24), have all been demonstrated, scientifically, to have attacked the fœtus while it was in the uterus. These cases all throw light upon the subject in hand.

No matter what may be assigned as the cause of eclampsia, uræmia, or albuminuria in pregnant women; whether we accept part, or all, or none of the many theories which have been advanced as to their ætiology — one of two conclusions forces itself upon us. Either it is possible for the pregnant woman to harbor a toxine or a germ, which is communicated to the fœtus, and is capable indirectly of causing an impairment of its kidneys, or there is a toxine or a germ present in the fœtus which is communicated to the mother and is capable of producing, in her, various forms of nephritis, eclampsia, or albuminuria. In support of this assertion he submits the following cases:

CASE 1. Mrs. A., 23 years of age, primipara, consulted the writer December 17, 1903. She was pregnant three months. Her urine was examined chemically at this time, with negative findings. The analysis was continued on an average of every two weeks, with like results, until about seven and a half months of her pregnancy, when her urine showed an albuminuria. A few days later, a specimen was obtained and sent to Dr. J. F. Biehn at the laboratory of the City Hall. The reported analysis showed a specific gravity of 1,015; urea, 9 per cent; albumin, ⅓ of 1 per cent. There were many epithelial and granular casts, phosphates, squamous epithelium, and much indican present. Her

urine was examined every twenty-four hours, and the condition remained practically the same. The patient became so œdematous that her features were unrecognizable. Her hands and feet were badly swollen. She had an irritating cough, and complained of agonizing headache.

Her removal to a hospital was advised, so that no time would be wasted in case of an emergency. Dr. R. S. Patillo was asked to make an examination of the fundus of the eye, and reported an albuminuric retinitis. The writer then decided to induce labor. Soon after the oculist saw her, the patient felt unusually active movements of the fœtus. This sensation ceased suddenly, and from then on, she did not feel "life."

The morning following Dr. Patillo's report, the patient was given a light chloroform anæsthetic. Rapid dilatation was done with Hegar's dilators until it was easy to introduce a colpeurynter. Within a few hours, normal labor began, and in less than twenty-four hours she was delivered of a dead male child, 4½ pounds in weight. Permission was obtained by the writer to extricate the kidneys. A complete post-mortem was refused. The bladder was opened and a dram of albuminous urine was found therein. The examination of the centrifuged specimen was unsatisfactory. The kidneys were taken to Professor Zeit's laboratory at the Northwestern University, and Dr. Goldsmith made the following report of the pathological findings:

Right and Left Kidney. Cells of the convoluted tubules irregular in shape and arrangement. The majority of the cells have no nuclei. Some round-cell infiltration. *Diagnosis:* Necrosis.

An examination of the mother's urine was made periodically for nearly a year subsequent to her delivery, and there were always indications of a chronic nephritis.

CASE 2. August 25, 1905, Dr. J. B. De Lee was called to see an emergency case of hemorrhage which was due to the premature separation of the placenta. Complicating this condition was nephritis. The writer was asked to assist Dr. De Lee in a vaginal Cæsarean section. The patient was delivered of a dead seven months' fœtus. The fœtus was taken to Professor Zeit's laboratory, and a post-mortem was made by Dr. Koehler. Through the courtesy of Dr. De Lee, the pathological findings made by Dr. Goldsmith are reported as follows:

Kidneys. Blood-vessels distended to a greater degree than usual. Convoluted tubules exhibit epithelium, which is, in part, swollen and granular. Some of the nuclei are absent. Capsule of Bowman somewhat distended. *Diagnosis:* Acute nephritis.

Liver. Has a "loose" appearance, as though œdematous. *Diagnosis:* Œdema.

Lungs. Blood-vessels are distended to a greater degree than usual. Some of the alveoli are distended with air. *Diagnosis:* Hyperæmia.

Heart. Blood-vessels are distended with blood to a greater degree than usual. *Diagnosis:* Hyperæmia.

In these cases we have undeniable evidence that the kidneys of the fœtus were badly diseased during its antenatal life.

CASE 3. April 1, 1905, one of the writer's families sent their domestic to him for a general dropsical condition. She gave a history of amenorrhœa from August, 1904. The dropsy had been marked for the month preceding her consultation, and accompanying it was shortness of breath, and headache. On pelvic examination, a diagnosis of pregnancy between the seventh and eighth month was made. She was put on a milk diet, and the following week was sent to a public institution. April 17, 1905, she had a normal labor and was delivered of twins. There was one placenta. The first baby weighed 3½ pounds. Soon after birth it had a convulsion. This was rapidly succeeded by others until it died, ten hours afterward. The other weighed about four pounds, and was born with hands and feet œdematous. On the beginning of the third day it had a convulsion, which was immediately followed by another, then coma for eight hours, and finally death.

Permission was obtained for a post-mortem on both these bodies. They were taken to Professor Zeit's laboratory, and the writer is again indebted to Dr. Koehler for the post-mortem and to Dr. Goldsmith for the pathological report.

First Baby

Kidneys. Cells of convoluted tubules were large and granular. The adjacent cells are divided by no direct line. Nuclei are, in general, indistinct; a few are wanting. The glomeruli exhibit clear zones between the capillary tufts and the capsules of Bowman, with only very slight evidence of any coagulable material. *Diagnosis:* Cloudy swelling and necrosis.

Liver. Cell columns separated by unusually wide venous spaces, partially filled with blood. Cells granular and boundaries indistinct. Nuclei generally present; few absent. Some of the cells exhibit fat granules; the cells containing fat granules have no nuclei. Slight round-cell infiltration. *Diagnosis:* Cloudy swelling; fatty degeneration.

Pancreas. Arteries and veins unusually distended with blood. *Diagnosis:* Hyperæmia.

Second Baby

Kidney. Cells of convoluted tubules large and granular, the lines separating the adjacent cells being indistinct. Nuclei, in general, are present; a few are wanting. There is a wide, clear zone between the capillary tuft and the capsule of Bowman, with only

slight evidence of any coagulable material. The interstitial tissues appear "loose," as though œdematous, and some hemorrhage is present. *Diagnosis:* Cloudy swelling and necrosis.

Liver. Cell columns separated by unusually wide venous spaces. Cell boundaries, in general, indistinct; cells granular; nuclei generally present, a few being indistinct or wanting. Slight round-cell infiltration. *Diagnosis:* Cloudy swelling and necrosis.

Thymus. Vessels, especially the smaller ones, distended with blood; some hemorrhage and interstitial tissue. *Diagnosis:* Hyperæmia.

In the case of these twins, we have incontrovertible proof that their kidneys became badly diseased prenatally, or a nephritis developed immediately after their birth. It is inconceivable that the latter could have been the case, inasmuch as ten hours was the life of the first child, and less than two and a half days the life of the second, and the lesions are too extensive, and indicate too chronic a nature, for so brief a period of life. We are justified in assuming that these children's kidneys were damaged antenatally.

The mother was kept under observation for many months, and at the present time is suffering with chronic nephritis and a secondary anæmia.

CASE 4. During July, 1901, Mrs. D., a multipara, six months pregnant with her second child, consulted me. A chemical examination of her urine was made at that time, with negative findings. Eight days later the patient complained of severe headache. She insisted that she had caught cold and was suffering from neuralgia. Her face was œdematous, and the extremities pit on pressure. A teaspoonful of the urine freshly voided was heated over the gas, and gave the appearance of solid albumin. The husband was immediately taken into confidence, and a vigorous attempt was made to stimulate the kidneys, in spite of the patient's loud demand for relief from her "neuralgic" headache, and for sleep. Early the following morning she was seized with a severe uræmic convulsion. An immediate delivery was advised, and Dr. T. J. Watkins was called in consultation. From then on, the patient suffered with eclamptic convulsions hourly. At noon she was taken to the hospital, and carried into the operating-room during a convulsion. Rapid dilatation with Hegar's dilators was used, and in about an hour and a half she was delivered with high forceps, of an under-nourished, 8 or 8½ months' male boy of five pounds.

There were no more convulsions after the delivery. The child was able to nurse. The albumin in the mother's urine and the œdema rapidly improved. The patient made an uneventful recovery, and was able to leave the hospital at the end of the third week.

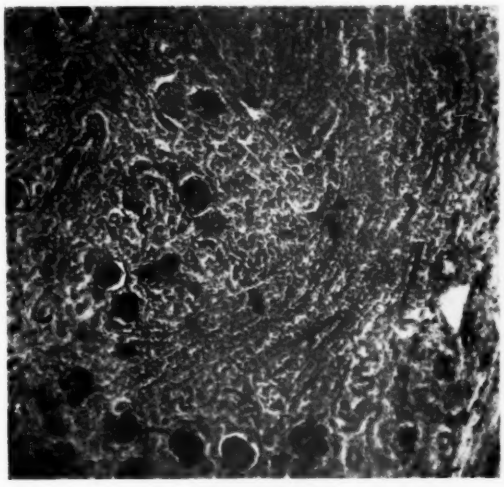
It is of interest to record that the patient's mother died in uræmic convulsions when she gave birth to the patient (who was the fourth or fifth child). A few months after her confinement, Mrs. D. beçame an ardent Christian Scientist, and was fully imbued with the idea that because of the author's methods of examining the urine of pregnant women, he induced various forms of nephritis in them by his "evil" thoughts on that particular subject.

When the boy was four years and several months old, the writer made a social call on the family, and requested the privilege of examining the boy's urine, in order to complete his report. The father gave permission. There had been no history of any illness on the part of the mother or son since the confinement (although it must be acknowledged that the existence of an illness would in all probability be ignored by virtue of their cult). The child was well developed, and while he could not be termed robust, he was not frail. He voided four ounces of urine, and a chemical examination of it showed a decided albuminuria. Many granular and hyaline casts were found.

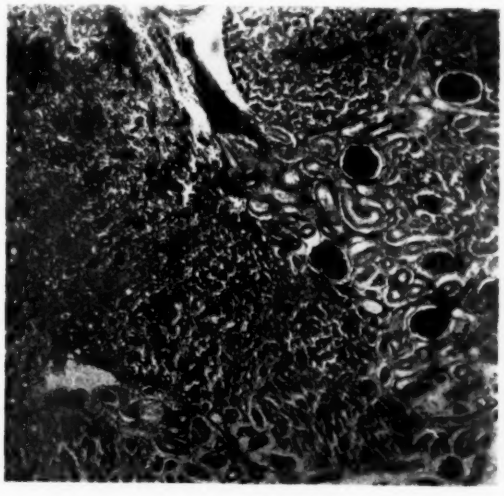
CASE 5. During April, 1905, the writer was called in consultation to see a pregnant woman who was very œdematous. She suffered with shortness of breath and severe headache, and was seemingly threatened with eclampsia. Her urine contained albumin and many granular casts. Although the patient was within two or three weeks of her expected confinement, it was considered advisable to induce labor. Accordingly a colpeurynter was introduced. Labor began within twenty-four hours, and continued normally until she was delivered of twins — two large, well-formed boys, weighing 8 and 7½ pounds, respectively. The mother made an uneventful and rapid recovery. Each child was catheterized within a few hours after birth, and each specimen showed a large percentage of albumin, and granular and hyaline casts were found in abundance. Unfortunately, the mother moved from the city immediately after her recovery, and it has been impossible to obtain further details of her case.

CASE 6. The author wishes to mention one more history. Four years ago, Mrs. F. died at the age of 36 years, in eclamptic convulsions. Dr. J. E. Gilman was in attendance, and had been treating her for two years previously for chronic nephritis. The child was born about 8 A. M. When the infant was an hour old the mother had a uræmic convulsion. This was rapidly followed by others until 9:30 P. M., when she died. Four years before her death, Dr. G. V. Hilton had delivered her of a poorly nourished female child at

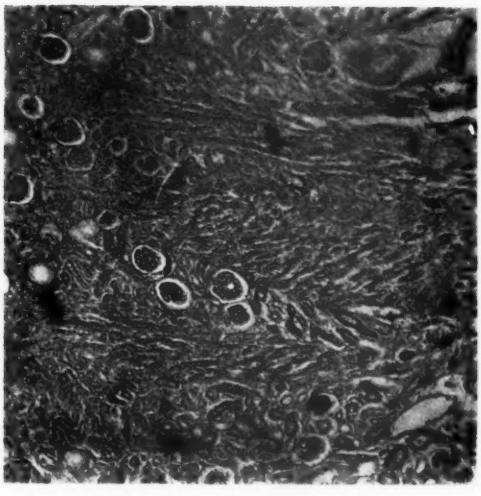
REPRODUCTIONS OF PHOTOGRAPHS OF KIDNEYS IN CASES REPORTED BY DR. GILLMORE



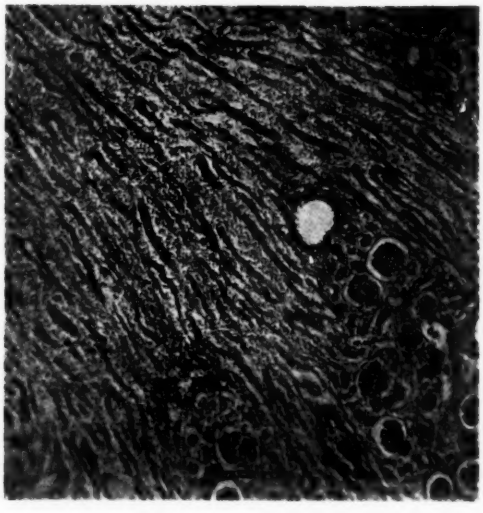
Case 1. Right kidney.



Case 2.



Case 3. First baby's kidney.



Case 3. Second baby's kidney.

term, which died of malnutrition in 25 days. During the entire time that the mother carried the child, varying quantities of albumin were present in her urine. Toward the last she was very œdematous, and suffered with many symptoms of uræmia.

Case A. When the youngest child was 2½ years of age, the writer was called to prescribe for her. She gave a history of tiring of her play and lying down during the day. She had not suffered from any of the eruptive diseases of childhood. The father said the child had periodically been subject to attacks of indisposition since her birth. A blood examination showed a secondary anæmia. The writer made an analysis of the urine, as is his routine custom with new patients. Albumin and numerous hyaline and granular casts were present. The child has been under his continual observation for the past eighteen months. During this time her urine has been examined every few weeks. The amount of albumin varies, but at no time has the writer failed to find granular casts. Blood-pressure taken June 10th: Systolic, 90; dyastolic, 84.

In May, 1905, the eldest son, 17 years of age, was preparing to take examinations in a military school, and the father desired a medical opinion on the boy's physical condition. The second sound of his heart was accentuated. Blood-pressure was taken June 10th: Systolic, 87; diastolic, 84. Urinary examination showed a decided albuminuria and many granular casts. After an interval of some nine months, a second urinary analysis was made, with the same findings.

April 16, 1906, the fourth child, a boy, 12 years of age, developed symptoms similar to those of his younger sisters, with an additional history of indigestion. Cardiac examination demonstrated an accentuated second sound. Blood-pressure: Systolic, 112; dyastolic, 84. An examination of his urine showed albumin. Granular, hyaline, and cylindroid casts were numerous. Since then two other specimens have been examined, with the same findings.

May 22, 1906, a specimen of urine from the two remaining children — a daughter 13 and a son 14 years of age — was requested. Both chemical and microscopical examinations were negative. May 26th, another specimen was asked for, to confirm the previous negative findings. There was no albumin, but a large typical granular cast, and several fragments of granular casts were found in the girl's urine. There was no albumin in the boy's urine, but many medium-sized granular casts were found.

June 10th, a final examination of the two last-named children was made. Accentuated second heart beat. Blood-pressure: Systolic, 90; dyastolic, 85. The daughter's urine was 1,032 in specific gravity. No albumin. The microscope showed many epithelial and pavement cells, oxalates, white cells, several hyaline and numerous granular casts. The boy's urine was 1,032.5 specific gravity. Albumin was precipitated with both nitric and picric acid. The microscope revealed pus and red cells, pus casts, hyaline, a few granular casts, and pavement epithelium. Cardiac examination demonstrated an accentuated second heart beat. Blood-pressure: Systolic, 110; dyastolic, 90.

All of the children have a history of eruptive diseases, except the last-mentioned daughter, who, with the exception of pneumonia when she was about two years of age, has had no well-defined disease.

A chemical and microscopical examination was made of the father's urine, as well as that of the paternal grandfather, with negative findings.

The writer wishes to call especial attention to the fact that the first, second, and third chemical examinations of the first daughter's urine was negative. He detected nothing in the first microscopical specimen. In the second he found a few granular casts, and in the third, several hyaline and numerous granular casts. In the second son, the first and second chemical examinations were negative, but in the third it was easy to demonstrate albumin. The first microscopical report was negative, while in the second and third there was positive evidence of a nephritic disturbance. This experience demonstrates how easy it is to overlook important urinary findings, as well as the fallacy of giving a positive diagnosis with one negative urinary examination. In all the above-mentioned cases a centrifuged specimen of urine was used under the microscope. A stationary stage was employed to insure a thorough observation of the field, and more than one slide was examined.

In conclusion, we must agree upon one proposition. Fœtal life depends for its existence upon the mother, and that dependency is possible only through the placenta. The placenta acts, *ex officio*, as lungs, digestive apparatus, liver, and excretory organs for the fœtus, and therefore we know that the fœtus must intimately share in the biochemical maternal blood changes.

We may, or we may not, believe that toxines in the maternal circulation pass through the placenta under certain circumstances, and act directly upon the kidney of the fœtus; but the controversy is closed on the somewhat mooted question as to whether a nephritic mother does at times give birth to a child whose kidneys have become nephritic during its antenatal life.

There may be good ground for doubting that a fœtus, whose kidneys are comparatively passive during uterine life, dying prenatally, or soon after birth, of an eclamptic or a uræmic mother, succumbed to the direct results of its

own nephritis. The cause of death, however, has no bearing whatsoever in disproving the tenet that it is possible for an antenatal impairment of the fœtal kidney to occur.

The author believes that this prenatal impairment of the kidneys does predispose, and is an almost universal factor, in producing an early post-natal nephritis.

Numerous observers are now calling our attention to the fact that there are many more chronic, insidious affections of the kidneys of the very young than was formerly supposed. Unfortunately, in many of these early cases of nephritis it is impossible to know in what condition the maternal kidney was before the birth of the child, and therefore it can only be surmised how much the mother may be responsible for the affected kidneys in her offspring.

Many cases of uræmic convulsions have been recorded where no albumin was discovered in the urine (25). Casts have been found without albumin and albumin without casts (26), and in both of these conditions the pregnant woman has suffered with uræmia or eclampsia. Certain classically suggestive casts are frequently overlooked on account of the refractive light ordinarily used to discover them, or from a too powerful lens without proper manipulation of the iris diaphragm and the condenser (27). On the other hand, many a prospective mother's urine has been loaded with albumin and casts and she has failed to present a uræmic symptom to warn us, either making an uneventful recovery or dying in uræmic convulsions.

We must admit that our present lack of knowledge and our inaccurate methods of diagnosing nephritis in pregnant women make it presumptuous for us to say that we have a perfectly healthy maternal kidney because a few hurried examinations of urine are negative, or because our patient's clinical picture has not attracted our attention to an existing nephritis.

Regarding all pregnant women, and the offspring of those women suffering from nephritis in any form whatsoever, the author cannot resist quoting an editorial comment by Dillon Brown of New York (28):

"Increasing experience proves that our errors have been nearly always of omission, and to presume that any organ, either in the adult or infant, is sound, is to invite confusion and danger. . . . A safe practical rule, and one from which there should be no deviation, is, *examine the urine of every patient*, regardless of his age and his apparent disease."

Brown finishes his editorial with a quotation from Leube: "'The omission of a urinary examination I heed to be nothing short of a capital error.'"

Exclude those cases of nephritis which are due to the elimination of chemical irritants — turpentine, phosphorous, etc. — and the clinical findings show that a large percentage of degenerative changes in the kidneys is due to bacteriological products which have damaged the kidneys during their elimination. This is demonstrated when acute nephritis occurs with various eruptive and other fevers, local abscesses, suppurative appendicitis, etc. And it is further borne out by the empirical treatment which has been most successful in kidney diseases. In certain forms of subacute and chronic nephritis, we get the best results with remedies which have a bactericidal action; namely, mercury (29), methylene blue, etc.

As long as we are confronted with those fatal cases of uræmia occurring after an anæsthetic has been administered for some simple operation, or where nephritis becomes a permanent sequel of some illness, especially a child's disease, we cannot conscientiously cease our investigations until we have determined how much of the ætiological factor is of prenatal origin.

Ballantyne has pleaded for prenatal therapeutics long and persistently, and the period cannot be far distant when this neglected branch of medicine will come into its own. If it is possible to treat nephritic children and infants successfully, it is certainly reasonable to suppose that we may reach the fœtus through the mother, and prevent, in some cases, or at least modify, the prenatal nephritic changes of the fœtus. We owe it to the future generation to leave nothing undone that may solve this formidable problem.

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DYSTOCIA FROM CONGENITAL CYSTIC KIDNEY OF THE FŒTUS[1]

With Report of a Case

From the Obstetrical Laboratory of the Johns Hopkins Hospital, Professor J. Whitridge Williams, Director

By FRANK W. LYNCH, Chicago

Assistant Professor of Obstetrics, Rush Medical College, Chicago; formerly Associate in Obstetrics, Johns Hopkins University, and Resident Obstetrician of the Johns Hopkins Hospital, Baltimore, Maryland

ALTHOUGH congenital cystic kidney of the fœtus has long been recognized as a cause of dystocia, we find that there are comparatively few cases on record in the literature. Consequently we report the following case, in which was observed a twin pregnancy presenting the unique feature of cystic kidney and hydronephrosis of size sufficient to cause an obstacle to the birth of the first child.

Case. The patient was a young colored woman, who was brought to the Johns Hopkins Hospital in labor on January 26, 1899. She was 26 years old, and had previously had three spontaneous labors, the oldest child being six years of age, and the youngest three. All the children were perfectly formed, and there had been no complication in the labors or puerperia. She was just about at full term, and the pregnancy had been uneventful up to the last four months, during which time she had been suffering with more or less œdema of the lower extremities.

On examination, the pelvis was found to be of normal dimensions, but the uterus was very large, immensely distended, and reached up to within two fingerbreadths of the ensiform cartilage. The back of the child could be made out to the left, and the fœtal heart was heard on the left side, just below the umbilicus, and was 160 to the minute. On vaginal examination, the cervix was found completely dilated, the membranes ruptured, and the foot and knee, together with the cord, were projecting from the cervix. The cord showed a pulse of 162, corresponding closely to the rate made out on abdominal auscultation. Chloroform was at once administered, and both feet were brought down. It was seen that they both were clubbed, and showed six toes on the right foot, while there were seven on the left. As vigorous traction failed to accomplish descent, the fœtal body was palpated by passing a hand into the uterus, when it was at once found that the fœtal abdomen was of enormous size, and appeared to be filled with a cystic tumor mass, which prevented the body of the child from entering the maternal pelvis. Accordingly an incision some 6 or 8 cm. in length was made in the fœtal abdomen by Professor Williams, and a hard, more or less nodular tumor was easily palpated, removal of which was attempted by the fingers. This proved a very difficult operation, inasmuch at the hand soon became cramped, and it was necessary for two to work in turn, until some 470 grams of cystic tissue had been removed and the abdomen became somewhat collapsed. A soft cystic body now presented in the wound, and yielded on puncture about one pint of clear fluid, after which the child was extracted without great difficulty.

A second fœtus was now found to lie in breech presentation, and having ruptured the membranes, delivery was easily accomplished by extraction. This child proved to be a female, normally formed, and of the weight of 2,090 grams.

The woman made a good recovery, and her temperature during the puerperium was never above 100°.

The Fœtus. The deformed fœtus was 42 cm. in length and 3,800 grams in weight. Projecting through the small posterior fontanel by an opening 2 x 2.5 cm. in diameter was a meningocele 4 x 3 x 2 cm. in size. Sixteen teeth were noted in the mouth, not ossified, but distinctly marked off, and cartilaginous in consistency. The right hand had a thumb and five fingers, and extending from the palmar surface of the little finger, an accessory finger was noted. The left hand had thumb and five well-developed fingers. Both feet were clubbed in the varus position and presented six toes on the right and seven on the left foot. The external genitals (male) were normal.

Autopsy. At the autopsy no abnormalities were noted, save in the liver, kidneys, ureter, and bladder.

The liver weighed 150 grams and measured 12 x 8.5 x 3.5 cm. in its various diameters. On its under surface, near the left margin, were a number of small, clear, round cysts, the largest of which were 4 cm. in diameter. The left margin was markedly thinned, and contained apparently almost no liver substance, its place being taken by a number of tubular shaped cysts. The gall bladder and ducts appeared normal. On sections of the liver, the parenchymatous tissue showed an unusual amount of connective tissue bands, which appeared to correspond to the site of the biliary canals. Under the microscope this sheath appeared cellular, and contained an unusual quantity of ducts, some tortuous, and evidently of new formation, others irregularly dilated into cyst-like cavities. The epithelial lining of these corresponded in character to that of the larger cysts, which was columnar in type. Great numbers of round cells were seen occupying spaces between the hepatic cells. The picture presented accords with that usually noted in similar cases.

The left kidney was the seat of the cystic growth, whose various pieces aggregated 1,190 grams in weight.

[1] Inaugural thesis of the Chicago Gynecological Society, June 15, 1906.

Of this, 470 grams were removed at operation, while the larger mass remained in the abdomen and measured 16 x 13 x 6 cm., weighed 720 grams, and filled nearly the entire abdominal cavity. It was everywhere covered by peritoneum, save at the right and inferior surface, which was the site of the destructive operation. Beneath the peritoneal covering, myriads of cysts were noted, of bluish gray color. The ureter measured 1.5 mm. in diameter at the junction with the kidney and presented a patulous lumen. It was attached to the middle of the posterior portion of the tumor.

The exterior of the kidney was divided into a number of small, irregularly shaped areas, some of which were distinctly cystic. The capsule peeled without difficulty. On section, the tumor was semi-solid, and was found to be composed of myriads of cysts, which ranged in size from several centimeters in diameter to one so small as to be perceived with difficulty. The fluid obtained from the larger cysts was of clear serous character. The microscopical appearance is considered on page 636.

The right kidney was represented by a collapsed sac 13 x 7 x 4 cm. Its exterior was generally smooth, while the interior was lined by a smooth, glistening membrane, under which were a number of corrugations which gave a honeycomb appearance to the whole. The wall of the sac measured but 2 mm. in thickness. The urinary bladder was empty, and a few centimeters above the bladder the right ureter was "kinked" and stenosed. The placenta measured 16 x 14 x 2.5 cm. and weighed 470 grams. Comparatively few small white infarcts were noted. On microscopical sections, the villi were found swollen and œdematous in appearance, and the connective tissue core resembled that of a four months' placenta in its cellular consistency. Otherwise the examination was negative, as was that of the umbilical cord.

Fig. 1. Photograph of case.

In 1725 there was reported to the Royal Society of Paris the first cystic kidney of which I can find record, although Forbes states that the condition was known to Willis at an earlier period. It would appear, however, that these cases were probably simple retention cysts, and that the congenital cystic kidney was not brought before the medical world for discussion until 1790. The majority of authors cite Osiander's case in 1821 as the first recorded instance in which the congenital cystic kidney of the fœtus caused dystocia, although we find that Merriman in 1810 described a case in which delivery was impeded by cystic kidneys and a fœtal bladder tumor which contained some 240 c.c. of fluid at time of death, eight hours after birth. Following these observations, other cases were recorded by Mansa and Jacobson (1828), Oesterlen (1840), Cormack (1845), and Bouchacourt (1845), who, according to Budin, also assembled the literature of that time, and since then by other observers, the number of which has been variously stated by different authors. Thus Nieberding, in 1887, claims that dystocia has been known in twenty cases in the literature, although in his original report he cites but fifteen. Budin and Demelin, in 1900, state there are some fifty casse, but give no bibliography, and we are inclined to believe from our review of the literature that this latter figure is possibly too large, and includes, in all probability, cases in which there was no dystocia. We naturally, however, should expect much confusion in various summaries, inasmuch as cystic kidneys are frequently seen in combination with other deformities of the abdomen, such as cysts of the liver, dilatation of the ureters or bladder, ascites etc.; and where a combination of these exist, it may be impossible to state with certainty as to the relative importance of the individual factors in the obstruction. While reviewing the literature we have found thirty-eight cases in which it appeared that dystocia

was due to cystic kidney; yet, if we exclude the cases in which destructive operations were not necessary, the list is reduced to nearly a third.

We may obtain many items of interest from a review of these cases. The girth of the fœtal abdomen which causes dystocia is usually 45 cm. or more, and the kidneys may attain tremendous size. Not infrequently they have weighed 1,000 grams, while the maximum, according to Winckel, was noted in the case of Andrae, in which they attained the weight of 2,250 grams. The disease is usually bilateral, and the fœtus is the frequent subject of other deformities. Among these we find hydrocephalus, hemicephalus, encephalocele, and meningocele, harelip and cleft palate, amniotic adhesions and constrictions, abdominal fissure, peromelia, club-feet, polidactyla; anomalies of the circulatory organs, such as congenital absence of the aortic valves, of the ductus Botalli, defects in the ventricular septum, cysts of the liver; various deformities of the genito-urinary system, such as hypospadias, rudimentary external genitalia, uterus bicornis and septus, vaginal septa, absence of a tube or ovary, stricture of the urethra or ureter, absence or deformity of the urinary bladder and ureter, hydronephrosis, absence of kidney pelvis, etc., while hydramnion and oligohydramnion have both been noted. As a rule, labor has been premature, but the maternal abdomen has been distended to a marked degree. Many of the cases were in primipara, and the subsequent history shows that the condition is apt to recur in later pregnancies, which point has long been emphasized by others.

The fœtus frequently presents in breech, although, unfortunately, data as to the presentation and position is often lacking. In 27 cases in which it is given we find: Vertex, 15; breech, 11; face, 1.

As would be expected, the greatest difficulty has been experienced with the vertex cases, as much time has been lost in determining the cause of the dystocia. Generally, the head has been born spontaneously, although forceps were used in several instances. Some few cases should be mentioned to give a proper appreciation of the difficulties experienced. Thus in Mansa's case, the midwife, before sending for help, pulled off the head in her effort to overcome the obstruction, and Mansa, in turn, pulled off both arms with the blunt hook, and finally was obliged to cut through the fœtal thorax and into the abdomen before accomplishing delivery. Likewise, Hoering decapitated to obtain room to cut away the chest, and Wilson cut away the head and arms and part of the chest without being able to dislodge the kidneys, which were finally forced out into the uterine cavity in the extraction of the trunk following version. Bruckner and his colleague spent the entire day in attempting delivery, and performed, in turn, decapitation, amputation of the upper extremities, thoracotomy, evisceration, version, and extraction, while Voss consumed three hours in effecting delivery in his case. Embryotomy was likewise necessary in the cases of Wolff, Witzel, Porak and Couvelaire, and Porak, which presented by vertex.

The cause of the dystocia was more readily ascertained in the breech cases, and Nieberding alone appears to have attempted an extensive destructive operation. The fœtus was dead before the case was brought to the hospital, and Nieberding, suspecting ascites, punctured the abdomen without result, cut away the fœtal legs and pelvis, removing the kidneys without further difficulty. In the cases of Singer and Uhde, simple evisceration alone was necessary.

It is remarkable that in these cases, which were mostly observed before the days of antisepsis, there was no maternal mortality; nor yet in the series of dystocia from hydronephrosis and allied conditions collected by Magenau, save in one instance, in which the uterus ruptured before delivery. There are some few cases in which the obstruction was not serious enough to necessitate evisceration, in which the newly born fœtus made effort to breathe. Death, however, speedily supervened, due, in all probability, to the encroachment of the tumor upon the thorax and consequent limitation of the movement of the diaphragm.

Various rules have been laid down to determine the differential intrauterine diagnosis, but, in general, it has not been made until puncture of the abdomen fails to reduce its bulk or the definite cystic masses are felt in the abdominal cavity; frequently the uterus is so firmly contracted by the time dystocia is recognized,

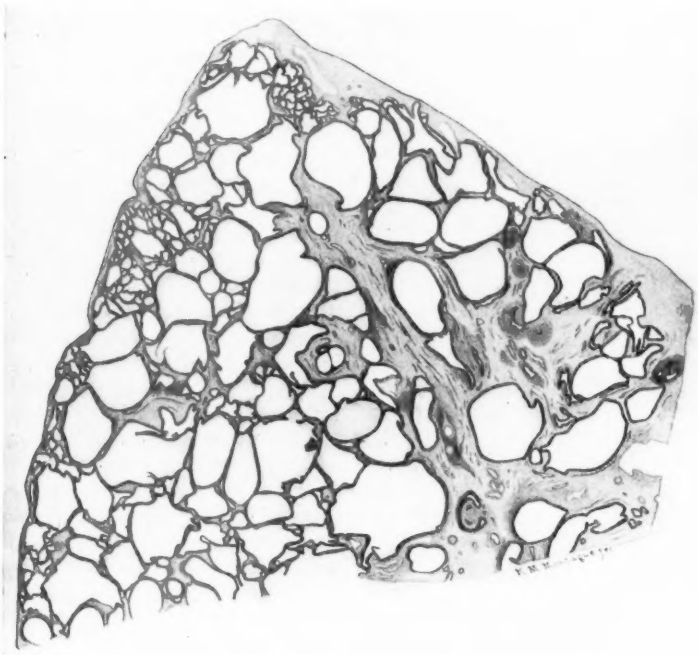

Fig. 2. Drawing of section of congenital cystic kidney, near cortex.

that careful palpation of the fœtus may be impossible. Suspicion should always be aroused by dystocia from overdistention of the fœtal abdomen associated with external deformities.

Many theories have been advanced to explain the ætiology of this disease, so many, in fact, that it has been questioned whether we have been dealing with a single pathological process. And yet, while the views advanced differ much in various details, there is enough similarity in the principles presented to admit of classification. Four theories are now recognized:

1. That the cysts result from obstruction and retention of secretion;
2. From errors in development;
3. New growth;
4. That the condition is of the character of both new growth and error in development.

1. The obstruction theory is the oldest of these, and assumes that the cysts are dilated uriniferous tubules and Bowman's capsules. It was first believed that the obstruction was in the lumen of the tubules. Thus Rokitansky, Förster, Frerichs, and formerly Virchow, ascribed it to infarction by various salts, as carbonates, phosphates, and urates; Ruyssenaers, Frerichs, and Albers suggested fibrinous exudate; Johnson, Erichsen, and others, impaction of desquamated epithelium and colloid substances; while Klein, Rosenstein, and for a time Brigidi and Severi, considered that the lesion might be nearer to the cortex, and attributed it to hemorrhage from the glomerular tufts with obstruction of the outlet and dilatation of the capsules. All of these views have been abandoned.

Many have referred the cause of obstruction to inflammation of the kidney, which theory was first advanced by Ruyssenaers in 1844. This view was elaborated by Virchow, who, having abandoned the theory that a uric acid diathesis in the mother, with consequent uric acid infarcts in the fœtal kidney, was the cause of stenosis, promulgated in 1855 the doctrine that has been adopted by the majority of the advo-

cates of the obstruction theory. Virchow now claimed that the disease resulted from intrauterine inflammation of the papilla, and that the subsequent contraction of the newly formed interstitial tissue caused papillary atresia, so that communication no longer existed between the uriniferous tubules and the calyces of the kidney. Moreover, he concluded that the cysts might lose their connection with the tubules from which they started, during the progress of the disease. He adhered to this theory in later life, and made it hold good even for the cases in which there was obstruction in the ureters.

Thorn, in 1882, carried the idea still further, and, in a case observed in an adult, showed that there had been extension of the inflammation from the kidney pelvis to the papillæ, resulting in atresia of the uriniferous tubules. Leichenstern, in 1884, also noted a similar condition in the cystic kidneys of an adult, which he designated nephropapillitis fibrosa. He assumed that the inflammation originated in the walls of the arteriæ rectæ, and then passed out to the papillary ducts, causing stenosis and retention cysts. Durlach, in 1885, reports a case in an infant of six months. The kidneys were large and cystic, and the pelvis was the seat of fibrous pyelitis; bands of connective tissue passed to the kidney surface through the columns of Bertini, excess of connective tissue was also noted in the lateral portions of the pyramids, and above this retention cysts. Arnold, in 1890, reported a case in a syphilitic fœtus, and demonstrated a nephropapillitis as the ætiological factor, holding that in the extension of the disease the tubules became constricted, with consequent alteration of the normal secretions. Among others who have favored this theory of intrauterine inflammation may be mentioned Stöhr, Mackenzie, Smith, Schultz, and Bockenheimer.

Others have taken the stand that a general interstitial new growth or cirrhosis has been the cause of the constriction of the tubules, and see in the congenital cystic kidney lesions analogous to the cysts in chronic nephritis. Sabourin was an enthusiastic advocate of this view, and Cornil and Brault have described various conditions of the tubular epithelium, secondary to the retention and resulting from a primary kidney sclerosis. Ebstein, Palm, and Ruckert have reported cases in which the fœtal kidneys shrunk to the size of a bean. Dunger notes a similar case in which the lesion was unilateral.

The obstruction theory has not proven satisfactory to all observers. Some, after reviewing cases presented in support of this view, have adduced them as evidence for other theories. Thus, Mutach observed a case presenting the same features as one which Virchow thus described: "The ureters on both sides were open only to the level of the lower rim of the kidney, where they gradually became narrower and the lumen stopped entirely, while the wall became merged in the connective tissue which filled the region of the hilum." "Atresia of the kidney pelvis therefore certainly existed on both sides." Although Mutach was able to see no opening in his case, he found he could inject alcohol from the ureter into the tubules, and by cutting serial sections demonstrated communication to the papillary zone. He stated, therefore, that with the laboratory methods of recent time, Virchow might have found that the atresia was not absolute. Others have called attention to the fact that as yet there has been no satisfactory explanation of a peculiar localized inflammation of the papilla of each kidney (for the lesion is commonly bilateral) associated with defects admitted to be the result of error of development of the kidney, such as absence of the pelvis of the kidney, branching of the ureters, etc.

2. Many have taken the ground that the great frequency of deformities resulting from errors of development in cases presenting congenital cysts of the kidney is of more than accidental relation. The probability of this view has been strengthened by the complexity of the process of development of the genito-urinary tract. Koster, in 1866, claimed that atresia of the papilla was more likely due to a primary defect of development than to an intrauterine inflammation, and called attention to the frequency of congenital defects of the kidneys, as absence of the kidney pelvis or ureters, in cases of cyst kidneys. He evolved his theory on the basis of Kupffer's conception of the development of the kidney; i.e., that the tubules develop independently of the pelvis, and fuse at a later period. Failure so to unite would cause this lesion. Koster advocated this

theory only for the cases which presented no kidney pelvis.

Shattock, in 1886, concluded that the cysts were retention cysts derived from portions of the Wolffian body which were included within the kidney, and called attention to the similarity of origin of cysts of the ovary and testicle. He supported this theory on the ground that the kidneys are developed in the following manner: The Wolffian body and kidneys are both developed from the intermediary cell mass of mesoblastic tissue which lies between the dorsal plate and the mesoblast of the somatopleure. This intermediate cell mass becomes divided into three portions: 1. Anterior, forming the pronephron, or head of the kidney. It is rudimentary, and disappears very early in the human embryo. 2. Middle, is the mesonephron, or Wolffian body, from which develop the generative glands. 3. Posterior, or metanephron, gives rise to the kidney. The ureter develops from the Wolffian body and becomes invaginated into the kidney to form the pelvis and calyces, while the glomerulæ develop from mesoblastic tissue connected with the aorta. "It may not be beside the question of want of demarcation between the meta and mesonephros," he says, "to refer to the doubling or trebling of the ureter, which is not rarely seen in man. One may regard the variation as a reversion to the lower type. In amphibia the mesonephron consists of an anterior sexual and a posterior non-sexual or urinary part; the collecting tubules of the latter, in the female at least, enter the Wolffian duct directly, so that there are as many ureters as there are segments of the mesonephric kidney. The connection of the two ureters with the Wolffian duct has subsequently been shifted from its side, as is normally the single metanephric ureter, which, in mammals, also primitively opens into the same duct. If this view is correct, it must be assumed that the portions of the kidney in connection with the superior of the ureters represents a persistent segment of the mesonephros, or permanent kidney, with which it retains its primitive continuity."

Mutach studied the kidneys of normal fœtuses between 15 and 30 cm. in length, and found that interstitial tissue was present in exceedingly large quantities in the apex of the kidneys

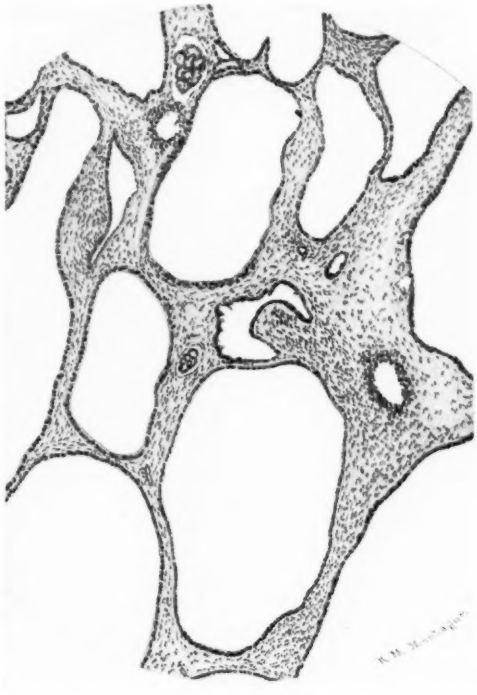

Fig. 3. Drawing. Intracystic papillary formation. +70.

in the younger specimens, but was less marked in the older kidneys. In both of his cases of congenital cystic kidney there was a similar increase of connective tissue of embryonic type about the papilla, which he thought could be attributed more fairly to a persistence of an embryonic condition than to an intrauterine inflammation of such limited extent, especially as a typical error of kidney development was observed in the second case, in which there was no pelvis, and the ureter was attached to the kidney by means of a number of minute tubules. Several islands of hyaline cartilage were also noted in the stroma of this case.

Hildebrand modified the view of Koster to meet the requirements of the modern dualistic theory of the development of the kidney, which assumes that both the glomeruli and convoluted tubules arise from one "anlage" and are joined secondarily by the collecting tubules which develop from the kidney pelvis. If the two systems of tubules fail to join, retention

cysts would form in the convoluted tubules. Springer, in 1897, and later Ribbert, in 1899, also make use of this conception, but emphasize as the causal factor a wild proliferation of the cells of the tubules which fail to join, rather than a retention of secretion. This proliferative tendency was so marked in Ribbert's case as to merit the description "tumor-like," which tendency has also been observed by Meyer and Busse. On the other hand, Bard and Lemoine have arrived at the conclusion in their case, that the ætiological factor was not a hyperplasia of the tubular epithelium, but rather a marked weakness of the walls of the tubules, especially of the basement membrane, which dilate under pressure of the normally secreted fluid. Among others who explain the ætiology of their cases on the basis of error of development may be mentioned Hanau, Mirabeau, Brouha, and Bland-Sutton, who did much to popularize the view of Shattock.

3. The theory that the cystic kidney is a neoplasm is usually thought to be of recent origin, yet we find that as early as 1875 Sturm expressed the view that the cysts originated from the epithelium of the convoluted tubules, which, as a result of the dilatation, hypertrophied, and later developed into bud-like processes of an adenomatous nature. In the following year, Michalowicz called attention to similarity of the appearance of cystic kidneys and cystic disease of the ovary, testicles, and mammary glands. Brigidi and Severi, in 1880, stated that the condition was definitely a new growth. They recognized an active proliferation of the epithelium of the tubules, and described the lesion as a cystoma of the kidney. Chotinsky, in 1882, also observed an active proliferation of the epithelium. Papillary outgrowths were frequently seen, similar to those in the cysts of the senile mammary gland. Many of the smaller cysts were filled with epithelium, and there was evidence of new formation of the tubules. Moreover, he found that the membrana propria was irregularly hypertrophied, and concluded that the primary factor was a hyperplasia of the tubules and of the stroma, as he could find no evidence that the glomeruli were concerned in the process. Philippson, although he thought that Virchow's doctrine might hold good in the fœtal lesions, described a proliferation of epithelium and of the membrana propria in adult specimens which resembled cystoma, and, although he drew no definite conclusions, stated that this proliferation must be considered as well as any obstruction in the tubules. Hommey, in 1887, also recognized the proliferation of epithelium which proceeded to cyst formation, and although he was unable to account for this condition, held, in contrast to Sabourin, that the proliferation of the epithelium was secondary. Lejars, in 1888, considered that the great majority of cyst kidneys were of the type of an "epithelioma mucoide," together with the cysts of ovary and testicle. Nauwerck and Hufschmid, in 1893, showed that the epithelium of the urinary tubules proliferates, fills the tubule, and causes its dilatation. The cysts arise from the colloid transformation of the epithelium and the transudate from the walls. In addition to the inward growth of the epithelium, which they regard as the essential point in the formation of the cysts, there occurs less frequently a progression of solid epithelial columns into the stroma. They definitely place the lesions in the group of adenocystomata. Von Kahlden, in the same year, also supported this conception, but emphasized further, that there was a coordinate development of the stroma analogous to that in adenofibromata. In 1894, he described the cystic kidney of a fœtus in which the histological picture strongly resembled the intracanalicular myxofibromata so frequently noted in the mammary glands. Since then there are many supporters of the theory that the condition is a cystoma, among whom may be mentioned, Mutach in his second case, Hansemann, Claude, Albert, Hein, and Schmitz.

4. If one accept the theory of Cohnheim that certain tumors arise from the proliferation of persisting centers of embryonic tissue, i. e., an error in development, it will be seen that there may be no sharp line of distinction between certain theories in groups 3 and 4, and several observers have taken a position midway between these theories. Thus Couvelaire, in 1899, objects to the consideration of the lesion as a tumor of the cystoma type. He holds that the process is essentially a general proliferation of the epithelium of the urinary

passages in the kidney, together with a correlated reaction of the connective tissue, in which the cells lose their specific character; and inasmuch as this change takes place in the developing organ, the lesion is to be considered as a malformation. Börst also considers it as an error of development, in the sense that it is due to a disturbance of equilibrium between the growth of epithelium and connecting tissue. He sees in the cysts of the kidney and liver a failure of the epithelium to develop in the normal manner, and as a result of its increased power of growth there is invasion of the connective tissue. However, he retains the lesion under the cystic adenofibromata. Bunting states that Luzzatto concludes that the pathogenesis of the cystic kidney is not uniform; that in the shrunken cystic kidneys the lesion is of an interstitial nephritis of fœtal origin, but that in the more common type it is to be regarded either as a malformation or a tumor of congenital origin, between which he is unable to draw a sharp line. Still, he is inclined to include four congenital cases of his study under fibrocystadenomata, and a fifth under malformations, due to an excessive development of connective tissue in the organs. Dunger also recognizes an inflammatory type, but believes that the largest number of cases are but "bildungs anomalie." He says in some instances there arises a proliferation of tissue consequent to the error of development, and the result is termed an adenocystoma, but we should constantly bear in mind that the cause is an error of development, and the adenocystoma merely represents the histological picture. Quite recently Bunting has had the opportunity of examining two fœtal cases in the early stages of the disease, and concludes that the position of the lesion in the pathological classification depends upon the definition of terms. "If it be a neoplasm, it differs from the conditions usually included under that term." "If it be a malformation, it is one in the sense of . . . a disproportionate activity in the growth of the epithelium."

Study of the cases in the literature indicates that there is great difference in the pathological pictures presented, and it seems quite probable that all cases of the disease could not be brought under one ætiological classification. Unfortunately, experimental pathology offers us no solution of the problem, inasmuch as the disease has not yet been reproduced experimentally. Pettersson recently attempted it by ligatures passed through the papillæ of guinea-pigs. His results, however, are similar to those of others; i. e., no cyst formation, but dilatation of all tubules, together with atrophy of the organ, sometimes destruction of the collecting tubules and the papillary connective tissue. Tollens also opened the kidneys of rabbits and cauterized the papillæ in order to cause stenosis of the ducts. After intervals of 4, 8½, and 12 weeks, the animals were killed and the kidneys examined. The first specimens showed kidneys of twice normal size, with minute cysts formed by the dilated tubules. The papillary ducts were closed by scar tissue, and there was considerable proliferation of the connective tissue as well as of the epithelium of the tubules. The later specimens showed atrophy of the gland, proliferation of interstitial tissue, and, occasionally, dilated tubules, and it is the general belief that an experimental constriction of the draining passages of glandular organs causes an atrophy of the gland, rather than a cystic change.

Kidney tissue from our case was fixed in various fluids, alcohol, Müller's and Zenker's fluids being used, and a series of serial sections was cut from different portions of the tumor. To the naked eye these presented similar pathological pictures, the chief difference being the size of the cysts and the thickness of the septa. No normal kidney tissue was anywhere seen, and the entire section gave the appearance of a piece of lace-work. As a rule, the cysts present a more or less rounded appearance, although they are frequently compressed into irregular outlines. Usually the cyst spaces are clear. The lining membrane is generally of a single layer of cuboidal epithelium with large rounded darkly staining nuclei. The connective tissue wall is many times as thick as the epithelial lining, and is composed of fairly cellular connective tissue, which frequently gives the appearance of a greatly thickened basement membrane. It is usually of even thickness. This, in turn, is supported by underlying tissue, containing comparatively few nucleated cells, and, in a

measure, it suggests the structure of the connective tissue of early chorionic villi. Some extravasation of blood is noted on the looser tissue spaces, yet, in general, there are few blood-vessels, and these present as normal.

Here and there tubules may be seen between the larger cysts, sometimes lying in the supporting connective tissue core of the cysts themselves. The epithelium is dark-staining and of columnar type. Occasionally the nuclei show evidence of proliferation, and in rarer instances the epithelium completely fills the lumen of tubules which seem to show some evidence of dilatation. Few glomeruli are seen, and when present they show evidence of dilatation with thickening of the capsule sheath. Projecting into the cysts, papillary growths are frequently seen. In general, they are composed of tissue presenting the general characteristics of embryonic cells. Frequently they contain in their substance tortuous canals lined by deeply staining columnar epithelium, which often presents evidences of proliferation. The epithelial covering of the intracystic growths is usually of single layer. Here, too, may be seen mitotic figures. No downgrowth of epithelium into the connective tissue was noted, although on all sections we can see columns of epithelium extending into smaller cysts. Rarely do we observe connection between the larger cysts. When present, these are short narrow canals lined by cuboidal cells.

When we attempt to determine the ætiology of our case we are naturally confronted with the question, Was there common cause for the hydronephrosis, cystic kidney, and the other deformities? It is, of course, impossible to answer this with certainty, yet it would appear from the uniform results of the experimental work of Aufrecht, Strauss and Germont, Holste, and others, on the cause of hydronephrosis, that this lesion is the result of the stenosed ureter. Orth, however, voices the opinion of the majority when he states that the cause of cystic kidneys must be sought above the kidney pelvis. Our sections give no support to the view that the lesion is the result of previous inflammation, nor yet of error of development, in the sense of failure of the tubules to fuse, which could be proven only in a kidney retaining some normal structure. The histological picture resembles that described by the advocates of the neoplastic theory: irregular growth of epithelium and connective tissue, the formation of new tubules, the presence of intracystic papillomata. These merit the term of adenocystoma.

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JEFFERSON MEDICAL COLLEGE
Department of Gynecology

A STATISTICAL STUDY OF DEATHS FROM CANCER IN THE CITY OF PHILADELPHIA, WITH ESPECIAL REFERENCE TO CANCER OF THE UTERUS

COVERING A PERIOD OF TWENTY-FIVE YEARS—FROM 1879 TO 1904

BY P. B. BLAND, M.D., PHILADELPHIA
Instructor in Gynecology, Jefferson Medical College; Assistant Gynecologist to St. Joseph's and the Philadelphia Hospitals

WITH the view of determining the mortality of cancer in the city of Philadelphia, with especial reference to deaths occurring from cancer of the uterus, covering a period of twenty-five years, from 1879 to 1904, I have analyzed the records of the Division of Vital Statistics of the Bureau of Health with the hope that the information thus obtained would be of some value as permanent reference. I had at first resolved to limit my paper to the statistical study of uterine cancer alone, but after a careful perusal of the cancer mortality, as reported to the Bureau of Vital Statistics, I was persuaded that a more general consideration of the deaths from cancer in this city would enhance the value of my paper, and, furthermore, illustrate in a profitable manner the relative frequency of deaths from uterine cancer to the deaths resulting from the occurrence of this dread malady in other structures of the body. Despite the fact that our means of positive diagnosis are infinitely superior to the methods practised twenty-five years ago, the figures I have collected demonstrate emphatically the truth of the generally accepted belief that carcinoma is decidedly on the increase. The gradual progressive increase is shown in the following chart. (Chart I.) In 1879, with a total city population of 846,980, 362 deaths from carcinoma were reported, while in 1904, with a total city population of 1,408,000, 937 deaths from this disease were reported. A marked increase was observed in the last four years. In 1901, 706 deaths were reported, while in 1904, 937 deaths were reported, thus showing an increase of 231 deaths during this period. Senn states that in England and Wales, from 1860 to 1870, 2,379,622 persons above the age of 20 died, and that this number included 81,699 deaths from carcinoma. The statistics collected reveal the fact that the

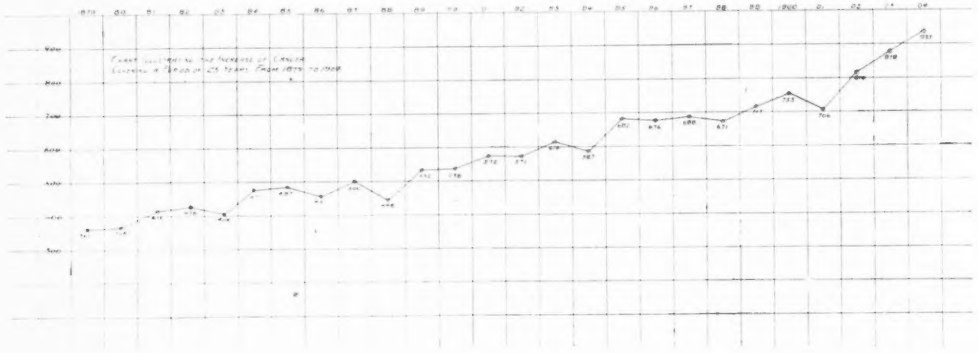

Chart I

total number of deaths occurring during the twenty-five years from cancer of all the organs classified by the Health Bureau aggregated 15,379. The figures show, furthermore, that more than twice as many females succumbed to this disease as males; 4,929, or 32⅓ per cent, of men dying, and 10,450, or 67⅔ per cent, women dying. The figures collected demonstrate that the excess in the female death-rate is due principally to the disease attacking the uterus. The analysis of the figures reveals the fact that this organ is the one most frequently affected, and that uterine carcinoma is decidedly on the increase, as shown in accompanying chart. (Chart II.) The total number of deaths occurring from carcinoma of the uterus reached 3,362, or 22 per cent of the total number reported. These figures, therefore, support the statement made by many authors, that nearly one fourth of all cases of primary cancer occur in the uterus. Welsh, in a collection of 31,482 cases of carcinoma, found the uterus to be involved in 29.5 per cent of the cases. A German investigator claims that one per cent of women between forty and fifty die of cancer, and that more deaths occur from this cause than from parturition.

The stomach ranks next in order of frequency, and the deaths resulting from carcinoma of this organ, including males and females, aggregate 4,535, or 37 per cent of the total number; 2,369, or 51 per cent, of the deaths from gastric cancer occurring in females, and 2,166, or 49 per cent, occurring in males.

Carcinoma of the breast ranks third, with 1,931, or 12½ per cent of deaths; 1,892, or 98 per cent, of the deaths from mammary cancer occurring in women, and only 39 deaths, or 2 per cent, occurring in men.

The liver, in order of frequency of involvement, holds fourth position, with a total number of 1,646, or 10½ per cent of the total number of deaths reported; 997, or 66⅔ per cent, of which occurred in women, and 649, or 33⅓ per cent, in men.

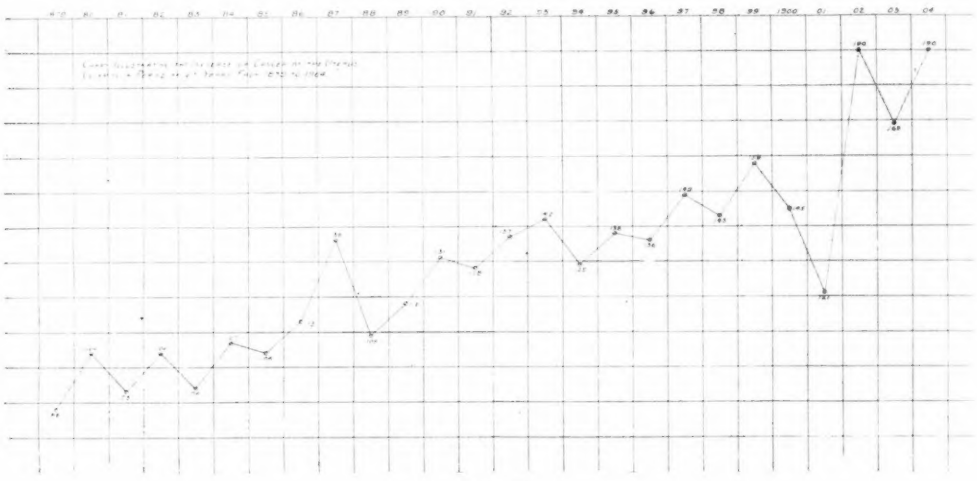

Chart II

The figures presented show that 82 per cent of the total number of deaths from cancer occurred in the four organs mentioned, the remaining 18 per cent occurring in miscellaneous organs. In an analysis of the organs affected, it was interesting to observe that in the female the disease was far more common in the abdominal and pelvic viscera, excepting the breast, than in the male, while in the latter the malady seemed to have a selective affinity for the mucous membranes above the diaphragm, the cutaneous and subcutaneous tissues.

It is a well-known fact that Philadelphia is constantly infected with typhoid fever, and while this disease is endemic in the city, there is scarcely a winter and spring passes without the city suffering with a more or less severe epidemic. Yet an analysis of the typhoid fever deaths in the city during the past twenty-five years shows that during this period only 15,407 persons, including children, died of typhoid fever, while 15,379 died of cancer during the same period, or only 28 more succumbed to typhoid fever than to cancer. Of course, it is well to remember that the advantages offered by the hospitals in the treatment of various forms of disease attract people from the surrounding country, and therefore the cancer mortality of the city may be increased by this means.

NATIVITY

It is astounding to note the tremendously large proportion of mortality of the foreign-born, in view of the much smaller proportion they bear to the total population of the city. The figures show that the mortality of the foreign-born aggregated 6,719, while that of American-born reached 8,045. Furthermore, it is of interest to observe the comparatively low mortality in the colored race, in view of the large colored population in the city, only 467 negroes dying of the disease during the twenty-five years studied. This observation would seem to confirm the accepted belief of the comparative immunity of the black race from carcinoma. According to the above figures, therefore, 55 per cent of the total number of deaths from carcinoma occurred in American-born, 40 per cent occurred in foreign-born, and the remaining 5 per cent in the colored race and in unknown or races unclassified.

NATIVITY IN UTERINE CANCER

In studying the nativity of the persons dying of uterine cancer, the records show that 1,977 were American-born, 1,096 were of foreign birth, and 135 were negroes. Those remaining were unknown.

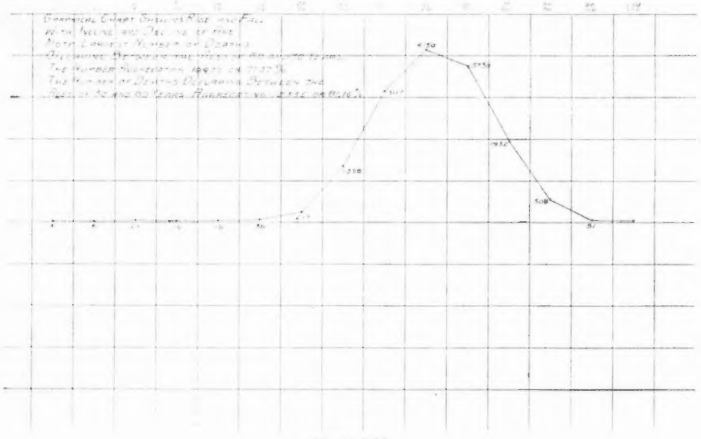

Chart III

AGE

In the consideration of so large a number of deaths from carcinoma, it is interesting to study the age at which the greatest number of deaths occurred. The following graphical chart will indicate that the highest mortality occurred between the ages of 30 and 80. (Chart III.) The chart, furthermore, shows that several deaths occurred extremely early in life, and while it is well known that cancer does occur at an early period of life, yet I cannot help but believe that of some of the cases reported, as well as the cases recorded in my statistics, a few, at least were instances of connective-

tissue malignant disease. Of the whole number of persons dying of uterine carcinoma, 3,354 were adults and 8 were minors. A study of the age figures discloses the fact that the largest number of deaths from carcinoma of the uterus occurred between the ages of 40 and 70; the total deaths occurring from uterine cancer during that period aggregating 3,232, or 96.13 per cent of the total number recorded. The following chart (Chart IV) will show the rise and fall in deaths of uterine cancer, with incline and decline of age.

DISTRIBUTION

The study of the distribution of carcinoma throughout the city shows that the disease is generally prevalent throughout all sections of it. The following chart will show that the

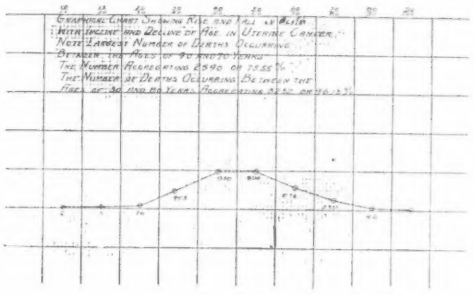

Chart IV

disease is most marked in the thickly populated sections of the city. (Chart V.) Furthermore, the chart reveals the fact that the death-rate was higher in those wards containing hospitals. A study of the distribution of carcinoma in the city does not confirm the general impression that the disease is most prevalent among the poorer class. Indeed, my figures show that the mortality of carcinoma is most marked in those sections of the city occupied by really the better class of people. A perusal of the following table will disclose the relation of cancer mortality in the different wards throughout the city. I have not arranged the wards in their numerical order, but have placed the wards with the largest cancer mortality in succession. The table shows also the different wards containing the largest and most prominent hosiptals.

Ward	Population 1900	Cancer Mortality for 25 Years	Hospitals
27	32,204	1,148	Blockley, or the Philadelphia General Hospital. Hospital of the University of Pennsylvania.
29	60,096	897	St. Joseph's Hospital. German Hospital.
22	51,296	730	Home of Little Sisters of the Poor. Germantown Hospital. Jewish Foster Home.
19	55,246	726	Episcopal Hospital.
15	50,379	710	
20	32,168	664	
24	53,023	654	Pennsylvania Hospital for the Insane. Presbyterian Hospital.
1	37,919	575	
28	439,31	522	Municipal Hospital.
7	28,137	509	Pennsylvania Hospital.
26	45,615	481	Howard Hospital. St. Agnes' Hospital. Methodist Hospital.
10	19,967	423	Medico-Chirurgical Hospital. Hahnemann Hospital.
30	28,874	414	United States Naval Asylum.
25	51,723	406	
2	35,206	380	
21	32,168	353	St. Timothy's Hospital.
33	65,372	346	
31	33,139	344	
8	15,757	333	Jefferson Hospital.
23	26,109	329	Frankford Hospital.
18	29,643	313	
32	39,889	311	
13	17,427	306	
14	19,405	305	
34	43,706	272	
4	22,562	264	
17	17,908	261	
3	24,693	251	
16	15,788	243	
5	16,868	240	
12	13,850	226	
36	46,811	208	
9	6,953	189	
11	11,843	181	
38	33,104	120	
37	22,445	119	Samaritan Hospital.
39	40,377	111	
6	8,042	108	
35	8,614	82	
40	19,438	67	
41	11,328	19	St. Vincent's Home.
42	13,536	19	Jewish Hospital.

JEFFERSON MEDICAL COLLEGE
Department of Surgery

REPORT OF A CASE OF TRAUMATIC ASEMIA

By J. CHALMERS DA COSTA, M. D., Philadelphia

THE literature on the loss of sign-language in deaf-mutes is extremely scanty. I have succeeded in finding but one paper on the subject, and that was a very interesting case reported by Dr. Charles W. Burr, in the *New York Medical Journal* of June 3, 1905, under the title, "Loss of the Sign-language in a Deaf-mute from Cerebral Tumor and Softening." Burr says that he has been able to find but one case, that of Grasset, which he found in the English edition of Oppenheim's text-book.

Grasset reported a case in which sign-language in the right hand had been lost after disease of the left hemisphere of the brain, although the right hand was not paralyzed. Burr's own case was in a woman 56 years of age, who had been deaf from early childhood and had never learned to talk, and who, five days before admission to the hospital, had an attack of right hemiplegia and had fallen unconscious in the street. The history showed that there had been repeated apoplectic strokes, and that right hemiplegia and right homonymous hemianopsia had developed. She was not blind in the left field, and she followed moving objects there, "but she gave no evidence of knowing what she saw." She could not express or comprehend thought by the sign-language, or by writing or pantomime. All the evidences indicated that she was mind-blind. This patient died, and the post-mortem disclosed a tumor surrounded by softening. The tumor was in the posterior part of the superior frontal, and in the superior part of the ascending frontal convolution. It was soft and not encapsulated, and extended to the basal ganglia, except that the cortical aspect was surrounded by softening, which involved almost the entire mass of the white matter of the hemisphere. The basal ganglia of the left side were almost completely destroyed by softening, partly due to hemorrhage, and partly to thrombosis. The growth itself was an extremely vascular glioma.

Burr points out that so extensive an area of disease does not enable us to show the localization of sign-language, but that it does indicate that it was in the left side. He then takes up some considerations about pantomime, which, he points out, is a natural method of expressing thought and emotion by muscular action other than that of the vocal muscles; and he emphasizes the fact that gesture expresses only emotion, and that deaf-mutes always use pantomime.

Mills shows us that the victims of a true motor aphasia often preserve pantomime unimpaired, and that word-blindness and word-deafness towards pantomime are most positive on the receptive side. Burr says that in true motor aphasia the victim understands pantomime, but that in sensory and mixed aphasia he fails to understand all of it, or he understands it incompletely. Burr further maintains that sign-language is only highly developed pantomime, and that the same laws control both; that sign-language is learned by vision, and hence a lesion of the visual center causes its loss. This same author concludes as follows:

"Whether there can occur a pure motor disturbance of the sign-language, the retention of the ability to comprehend (a normal visual center) with a loss of the ability to express thought by signs, on account of a lesion making it impossible to recall muscular movements to make it, is, I believe, unknown. Pure motor amimia in persons who are not deaf-mutes, unassociated with any form of verbal aphasia, has never been described."

Burr, it will be observed, uses the term "amimia" to mean disorder of pantomime. I use the term "asemia" to mean loss of sign-language. It seems to me that in the case reported below we have some of the phenom-

ena that, according to him, have not previously been described.

The case here reported possesses some elements of unusual interest. It is extremely unfortunate that the surgical condition was so urgent as to forbid even a slight delay for purposes of thorough study. Hence the report is made by a surgeon, ill trained in following the by-paths of neurology, instead of by a neurologist, capable of correctly observing, thoroughly studying, and completely reporting some of the most curious manifestations of the injury.

The man, John L., 60 years of age, was brought into the hospital of the Jefferson Medical College. A few minutes before admission, he was knocked down by a team of horses, and in falling had struck the right side of his head upon the stones. When picked up by a policeman, he was unconscious, but he partially regained consciousness on the way to the hospital. On admission, he was semiconscious. The extremities were cold, the pulse was slow and weak, the temperature was slightly subnormal, and the pupils were equal and a little dilated, but reacted to light. There was moderate bleeding from the nose. A distinct and rapidly enlarging subconjunctival ecchymosis of the right side of the right eye existed, and in the right lower frontoparietal region was a scalp wound somewhat over an inch long, from which blood flowed freely and persistently.

A few minutes later, when I saw him, he was entirely conscious. His temperature had become normal. His pulse, which had been weak and slow, had risen to eighty and was fairly strong. Almost the entire right eye was bloodshot. There was no paralysis. The left ankle was severely contused. On inspecting the scalp-wound, exposed bone was seen, and a fracture was observed. Most of the profuse bleeding came through the break in the bone, and not from the scalp.

The resident physician reported to me that the man had not spoken a word since his admission. The patient watched attentively and with apparent interest all that was going on around him, and made a series of curious noises. He lay perfectly quiet, except for motions with his fingers, and it was a little while before we grasped the idea that he was trying to talk to us in the deaf-and-dumb language, using both hands. This language was to me as meaningless as Choctaw; but, fortunately, a hospital orderly understood it, and undertook to converse with the patient.

The orderly asked the man's name, and the patient watched eagerly as the question was composed. An answer was returned, that obviously excited the surprise of the interrogator. Again the orderly put the question, and again be obtained an unsatisfactory reply. The orderly informed us that the man's answer to the question, "What is your name?" was, "How? what?" He was asked his address, and his answer was, "How? what?" He was again asked his name, and he said, "How? what?" A pencil was shown him, and he was asked what it was, and he replied, "How? what?" To every question he returned the same meaningless answer, using his fingers firmly and rapidly, and seeming to think each time that he would succeed in conveying his meaning. When he realized that he had failed in doing so, he showed disappointment and anger by emotional gestures. These words seemed to be the only ones accessible in his verbal storehouse, and he used them for everything — for affirmation, for denial, for his name, for his address, for the date, for the day of the week, for the season, and for designating a number of different articles.

He either could not or would not repeat signs after they had been made. He would shake his head in affirmation or negation, and seemed to do it correctly. Questions were written and shown to him, and he seemed to read them; but whether he understood them or not, could not be told, for he gave the same automatic answer with his fingers. A pencil was given him, and he was told to write his name. He took it in his right hand, and he drew a series of meaningless curves and lines.

It was perfectly evident that this man was utterly unable to express his ideas by the means he was accustomed to employ — that is, by signs — although he seemed to understand all that was said to him by signs, and to realize with irritation his own inability to respond. There was no paralysis of either hand, but he could not or would not write with either the right hand or the left. We were not sure then that he knew how to write, but we afterward learned that he did know.

His head was shaved and disinfected, ether was administered, and a scalp-flap was cut and turned down. A greatly depressed fracture was at once disclosed, being chiefly situated in the greater wing of the sphenoid bone, but with lines from it running off into the parietal and into the frontal bone. The patient was trephined, and a blood-clot of small size was found between the dura and the bone. A large bone-fragment had been driven upward and forward beneath the level of the surrounding bone, had penetrated the dura slightly, and must have made pressure upon the lowermost part of the frontal lobe. The bone-opening was enlarged by means of rongeur forceps. The anterior branch of the middle meningeal had been torn on the dura, and after the clot had been removed, bleeding from this vessel was arrested by employing two suture ligatures of catgut. The wound was washed with salt solution, and some bleeding from the torn dura was arrested with the sutures of catgut, which closed the dura. A careful inspection of the situation pressed upon by the depressed and separated fragment indicated that it must have been upon the lower right frontal convolution. A hairlike fracture was observed to pass into the roof of the orbit. A small piece of gauze was inserted for drainage, and the scalp was sutured. The conjunctival sacs, nares, pharynx, and mouth were cleansed; and iodoform was insufflated into the nostrils. In the subsequent care of the case, the cleanliness of these parts was scrupulously looked to.

A few hours after the operation, when the effects of the ether had worn off, the hospital orderly was again brought into requisition to talk to this man, and every question was at once and intelligently answered. We learned later, from his wife, that the patient had been deaf from his earliest childhood, and that he was right-handed. We learned from the man himself that he knew how to write, and that he remembered being unable to express his ideas by signs or by writing, and the pain that this had caused him. He stated that he had not understood the writing, but had understood the signs. He made a rapid and uninterrupted recovery.

To sum up the foregoing case briefly, we see a man that, as the result of a head injury, could not express his thoughts, either in writing or with the signs that he was accustomed to employ; that could understand signs made by others, but could not understand writing; that was angered by his own failures in making signs and in trying to write, and expressed his anger and disappointment with gestures; and that made many efforts to give vent to ideas, but succeeded in expressing only two words by signs, these words being mere automatic expressions, and utterly inappropriate and unmeaning as replies. This condition was apparently due to pressure on the third right frontal convolution, and passed away completely on the relief of pressure. It is, of course, possible that there was trouble in the opposite hemisphere from concussion, but there was no sign of its existence after the anæsthetic was recovered from.

The man's condition seems to have been impairment of sign-language, forgetfulness of the symbols of his speech or of how to co-ordinate his movements to make these symbols—a condition analogous to an ordinary motor aphasia affecting phonetic speech. The constantly repeated, "How? what?" seems to have constituted what Gowers calls recurrent utterances, and recurrent utterances, we remember, Hughlings Jackson has designated, in speaking of ordinary aphasia, as of low speech-value. It is thought by some that the recurrent utterances of ordinary aphasia are the last words spoken before the injury or the attack; by others, that they are the words that were about to be pronounced when the accident happened or the attack occurred. It does not seem that either of these explanations would fit this case.

This man could not write, and it is interesting to recall that both the process for sign-language and that for written language must depart from the hand center in the cortex, but must be energized in the speech center. It would seem that the speech center of this man must have been in the third right frontal convolution. In talking by signs or in writing, the adjacent hand center must have been energized from the speech center, and as the hand center first energized controlled the left hand, the hand center in the left side of the brain, which controls the right hand, must have been energized by commissural fibers from the hand center in the right cortex. Both hands were used in making signs, and expression with both hands was affected in this case. It is odd to recall that this right-handed man, with the speech center on the right side, used the right hand in writing, when he could have gotten impulses only from the left-hand center by that being energized from the right-hand center. Whether in deaf-mutes it is usual for the third right frontal convolution to contain the center for sign-language, or whether this case is an absolute exception, I do not pretend to know.

I have been in grave doubt as to what to call the above-described condition. The term "amimia," which, I believe, was suggested by Kussmaul for impairment of pantomime and signs, might perhaps be used. Dr. Keen submitted the question to Professor Albert Harkness, the distinguished Greek scholar of Brown University. Professor Harkness suggested "asemia." He writes to Dr. Keen as follows:

"I think the word you need is asemia. I have formed it from the classical word *ἄσγριος*, just as *σοφία* is formed from *σοφός*; *κακία* from *κακός*. *Ἄσγριος* means without a sign or mark, making or giving no sign. It is applied to sacrifices which fail to give any sign. I think it would be perfectly applicable to your deaf-mute who had become incapable of giving the usual deaf-mute signs."

JEFFERSON MEDICAL COLLEGE

Department of Gynecology

THE RELATION OF THE GENERAL SURGEON TO THE PRACTICE OF GYNECOLOGY

By JOHN M. FISHER, M. D., Philadelphia

Assistant Professor of Gynecology in the Jefferson Medical College; Gynecologist to the Philadelphia, St. Agnes, and Phœnixville Hospitals; and Assistant Gynecologist to the Jefferson Medical College Hospital

THE rare genius in surgery who is capable of dealing with the eye, the nose and throat, the female pelvic organs, and all the other special structures of the body, with skill as a diagnostician, in the exercise of surgical judgment, and as an operator, and who contends, or pretends to assume, that surgeons of ability in general are equally fitted for doing likewise, either aims to mislead or his mind is tinctured and tainted with the fallacy that all men are created equal. Professor Trendelenburg's evident implication pertaining to the effacement of what he termed "the artificial line of division between surgery and gynecology," in his introductory address at the recent meeting of the American Medical Association, may be excused because of some foundation in fact, in so far as it relates to his own professional attainments, but his observations and mental vision concerning the practice of gynecology on the part of general surgeons of recognized ability in our own country must have been obscured by contact with precocious luminaries of the Mayo type and their retinue of specialized assistants, or with the comparatively few who have made gynecology a study rather than a convenience and a mere incident of their general surgical work. Had he indicated the evolutionary ascent of the gynecologist from the pelvis to the abdominal cavity, and insisted upon a trained touch developed by constant practice in bimanual manipulations as a legitimate requirement in gynecological diagnosis, and dwelt upon the advisability of making a pelvic examination in almost every woman suffering from bodily symptoms below the diaphragm, and had he thus recognized the natural and necessary relationship of gynecological and abdominal surgery and their combined advantage as a distinct specialty, he would have done the profession at large a useful service, prodded many of his hearers to increased attention by touching some of their weaknesses in spite of their feelings of self-sufficiency, while giving but slight though well-earned credit to the claims of the gynecological specialist.

Far be it from me, however, to minimize the good work of others, or to claim that I know more about gynecology than some of my friends engaged in the practice of general surgery; but as chief assistant to the chair of gynecology in a teaching institution, and gynecologist to three hospitals, I occupy a position that, for some reason or other, frequently commends me to the favorable consideration of the general surgeons, either in the capacity of a critical observer, or to lend a helping hand in their own sporadic ventures in gynecological surgery, and, judging from my observations and experiences, I am more than ever convinced that the gynecological specialist of average ability is vastly better fitted to treat women suffering from pelvic ailments than the most brilliant of general surgeons, whose skill in diagnosis is usually limited to the recognition of palpable pelvic conditions only, or whose mechanical dexterity in other fields leads to the exercise of an indiscriminate sense for doing operations for the relief of pelvic symptoms in the absence even of pelvic disease.

The use of the knife and the curette is neither the beginning nor the end of gynecology, and the successful specialist in this line of work is something more than a mere surgical mechanician. To illustrate and emphasize my contention, I can do no better than quote somewhat at length from my paper on "Dilatation and Curettement of the Uterus" (*American Medicine*, October 24, 1904):

"There is no surgical procedure that serves so many beneficent purposes at the hands of the

properly trained specialist, and on the other hand none that is fraught with so many possibilities for evil when practised by those whose skill in pelvic diagnosis is founded upon insufficient knowledge and want of experience, as that of dilatation and curettement of the uterus.

"The contraindications to the performance of the operation as an independent procedure cover a field in pelvic pathology that embraces wellnigh every disease of the extrauterine structures, the determination of which, in many instances, demands a tactile sense that can alone be acquired by long-continued and constant practice in making pelvic examinations, supplemented by the ever-recurring corrective influences of a well-appointed apprenticeship at the operating-table.

"The difficulties and uncertainties besetting gynecological diagnosis are sufficiently evident to the trained hand, even in this line of work, as often to raise a doubt of the propriety and the safety of the operation in cases in which the symptoms and physical signs appear to point to the procedure as a positive indication, but in which the history of a pelvic inflammatory attack, possibly many years previously, although apparently cured, has left an indeterminable but suspected residuum in the form of a quiescent salpingitis that may manifest all the latent properties of intense energy if its smoldering embers are but stirred into activity, as is so frequently done by an ill-advised dilatation and curettement.

"In this connection it is likewise well to bear in mind that in not a few cases does the proper interpretation of symptoms associated with uterine disturbance not alone depend upon the diagnostic acumen of the gynecologist with an eye single to the pelvis, but the practitioner's skill as a physician, in the widest possible sense of the term, is called into requisition. For example, there is no pelvic symptom that is so frequently taken as an indication of the presence of disease demanding curettement, and yet none that in more instances may be merely a uterine expression of a general condition, or of a diseased state of some distant or neighboring organ, as hemorrhage from the uterus. So, too, with reference to chronic catarrhal discharges, these not infrequently are associated with corresponding conditions of other mucous tracts depending upon some constitutional dyscrasia, such as scrofula, tuberculous disease, syphilis, or some other disorder that tends to a generally lowered state of vitality. In women of a lymphatic type of organization a relaxed state of the mucous membranes, with consequent hypersecretion, is not an infrequent symptom of slight constitutional disturbances, but when this is observed in connection with the uterus it is too often taken as an index for a dilatation and curettement of its cavity to cure a supposed endometritis that has no existence in fact.

"Pelvic pain, although a common symptom in connection with almost all forms of pelvic disease, may be a part simply of a vicious constitutional circle, referable, perchance, in a given case, to a general nervous or circulatory disturbance, or, it may be, to vices in the habits or the nutrition of the individual, but when it is associated with menstruation, and especially in the presence of a uterine flexion, possibly of indifferent significance, it likewise becomes a common pretext for this form of surgical interference.

"It follows, therefore, that the interdependence of all the organs and tissues of the body in health and disease must be constantly borne in mind by the careful and conscientious practitioner. A correct diagnosis is of first importance to successful treatment, and the specialist cannot escape the responsibilities that rest upon him as one who should not alone be well grounded in the principles and the practice of his art from a surgical standpoint, but whose skill in pelvic diagnosis should be tempered with a well-balanced professional judgment, the result of a previously matured experience in the practice of general medicine. He should, moreover, never feel himself excused from having frequent recourse to conferences with fellow-practitioners capable of supplying professional deficiencies in the diagnosis of doubtful cases, before resorting to an operation that is filled with so many possibilities for evil. Individually considered, however, the mistaken diagnoses and the adoption of ill-advised plans of treatment in uterine disturbances depending upon extrauterine conditions, on the part of the specialist, are insignificant in number as compared with the numerous serious diagnostic blunders, and the

dire consequences that often follow in the wake of the dilator and the curette at the hands of the unskilled.

"To dilate and curette by mistake a uterus that is simply the seat of a functional disturbance, the result, possibly, of some unrecognized constitutional disorder, and in the absence of palpable pelvic disease, will, with comparatively few exceptions, do little if any harm; but when this alone is done in the presence of some pathological condition demanding additional surgical treatment, which might have been discovered by a trained hand in pelvic diagnosis, but which was unwittingly overlooked by the uninitiated operator, it may not only mean an acute exacerbation of existing trouble, but superadded disease, and possibly death to the patient.

"Compared with the specialist, therefore, it becomes the family practitioner to consider it a double duty, at least, to avail himself of the skill of the former in pelvic diagnosis before resorting to so easy a mechanical procedure, apparently, as an instrumental dilatation and curettement of the uterus. Yet, simple as it may appear, it is an operation that calls for great delicacy of touch and the observance of the most rigid asepsis and antisepsis. Not a few uteri are forcibly and permanently retrodisplaced and prolapsed as a result of overstretching and consequent paralysis of their ligamentous supports by traction in order to bring the organ into view for dilatation, and the want of proper aseptic precautions is frequently responsible for the introduction of septic material and the spread of sepsis from an infected uterine cavity. All this may sound like a plea on the part of the gynecologist for the preservation of the integrity of his specialty, but 'he who runs may read' by making a single visit to the wards of our hospitals and there noting the far-reaching evil consequences and the number of abdominal sections necessitated by previously ill-considered operations of this character. In the hands of the inexperienced in pelvic diagnosis and of the unskilled in operative manipulation, dilatation and curettement of the uterus therefore may well be classed among the most hazardous of gynecological procedures."

There probably is nothing in the clinical pathology of new growths more conclusively established than the fact that cancer of the uterine cervix almost invariably originates in some form of a well-defined and originally benign irritation that is easy of recognition long before the dread disease has made its appearance. That heredity, age, environment, poverty, long-continued disorders of nutrition, and more especially the vasomotor disturbances incident to the menopause, are important factors as predisposing causes is likewise generally admitted. Considering the prevalence and fatality of the disease, it is vastly more important, therefore, to diagnose and correct the local and constitutional abnormalities that tend to the development of the malady than to do an ideal hysterectomy after it has made its appearance, with the certainty in mind of its recurrence in more than 95 per cent of the cases. In no class of cases is the weakness of surgery in ultimate results so forcibly illustrated, although in none other are there the knowledge, the means, and the measures at hand for demonstrating its claims, both as a science and as an art, along the more important lines of prophylaxis; and yet, to what extent do we find the general surgeon of our day concern himself with these so-called minor medical and surgical gynecological problems?

It is well known, at least to every gynecologist of experience, that the traumatisms of childbirth bear a direct, and with but few exceptions a constant, relation to the development of cancer of the cervix. Dr. T. A. Emmet, in his entire experience, had seen only one case of cancer of the cervix in a nullipara, and Dr. H. A. Kelly mentions three, in one of whom the cervix had been forcibly dilated. While cervical lacerations result in well-marked though inconstant alterations in the anatomical conformation of the organ, only a certain proportion terminate in changes of structure or of form that can be regarded as pathologically or clinically abnormal, and the possible seat of carcinomatous development later on. Neither the depth of the tear or extent of tissue involved, nor the size, shape, or density of the cervix, within certain limits, can be taken as a criterion for solving so important a clinical problem. The normal cervix in nulliparous women, even, differs in size and conformation, just as individuals differ in looks and in stature. One's own common sense, therefore, should dictate that the clinical significance

of cervical abnormalities and their relation to cancer are best determined by those who make the intricacies of gynecological diagnosis a daily study in the school of practical experience. The rules that should govern the practitioner in his advice to and in the care of women after child-birth, relating to the prevention of cancer, in accordance with my own observations, is seldom, if ever, referred to by the general surgeon. He concerns himself, if at all, with the practically hopeless reality — the presence of cancer — and merely measures results by the number of recoveries from operations, without thinking of how the approach of the disease might have been anticipated by a timely correction of the benign abnormality that offered the soil for its development.

Considering the present status of medical and surgical practice, it must be conceded that all that pertains to the prevention of cancer of the uterus, in so far as it is inherited or acquired by certain conditions, of necessity still comes under the care of the gynecologist both as a surgeon and as a physician, and the more the true function of the gynecological specialist in this particular is thus recognized, the greater will be the advance toward the limitation and eradication of this scourge of womankind.

What is true of traumatisms of the cervix from the standpoint of ætiology and prophylaxis in the study of cancer obtains with even greater frequency in connection with displacements of the organ, and applies with especial force to a considerable proportion of pelvic inflammatory conditions. The immediate correction of these abnormalities in suitable cases by the obstetrician, or their recognition and repair before the occurrence of serious secondary changes by the specialist, certainly redounds more to the credit of gynecology as an art, and gives it more of a standing as a science in preventive medicine, than all the glamour attending an abdominal section for the relief of a suppurative process that never should have existed. The interrelationship of obstetrics and gynecology in many other particulars is none the less important, and the gynecological specialist as a matter of necessity must be, and in fact we find as a rule he usually is, intensely interested in all that pertains to the science and art of obstetrics. He is always ready to respond in cases of obstetrical and puerperal emergencies, and but rarely is he found wanting in a proper equipment for meeting them. With him a stitch in time in obstetrical work frequently saves nine in gynecology. The general surgeon, on the other hand, as he rises in the scale of his profession, usually loses the interest he may have had in obstetrics and in the so-called minor gynecological after-consequences so pregnant with meaning to the experienced specialist.

One of the graver faults of the general surgeon as I have met him in his gynecological work is, he rarely makes a vaginal examination, save in the presence of pelvic symptoms. It evidently occurs to him comparatively rarely that remote bodily symptoms in women frequently depend upon pelvic disorders. Time and again have I seen the upper abdomen opened by men of recognized ability for supposed disease of the biliary organs or of the digestive tract, when, to their surprise, they discovered that nothing of the kind existed, and to their chagrin, later on, that the pelvis was blocked by an inflammatory process or a new growth that any novice in diagnosis could have detected by a simple bimanual examination.

The frequency with which right-sided pelvic disease in women is mistaken for appendicitis by the general surgeon is known to every gynecologist, and he is likewise aware of the fact that the removal of a normal appendix follows in almost as large a proportion of these cases as though the disease really existed, while the true cause of the patient's suffering is overlooked, and remains a menace to her future well-being, with the added shock and danger of a useless operation.

Some time ago I had the privilege of removing a pus-tube forming a well-defined right-sided mass with firm fixation of the uterus, from a patient who had undergone an operation for appendicitis a few weeks previously by a surgeon of large experience who has always been very loud in his protestations that "surgery is surgery, and gynecology is simply a part of general surgery." The disease in connection with the appendix was designated "catarrhal." Had this surgeon taken the precaution of making a pelvic examination as a part of his investigation, I have always felt that the mass was large enough not to have escaped even his

detection, and that his surgical efforts would have been directed to other quarters rather than to the right iliac fossa.

In another case of supposed acute appendicitis, a normal looking appendix was removed, without relief, by a professor of surgery who is regarded as possessed of rare surgical judgment. A pelvic examination subsequently disclosed a fixed uterus with inflammatory masses the size of a fist, filling the pelvic cavity, necessitating the removal of both uterus and appendages.

Within a comparatively recent period two cases of ruptured tubal pregnancy have come under my observation, both of which were diagnosed appendicitis by men whose names are familiar to surgeons everywhere, and yet in each of these patients the vaginal vault was bulging from the presence of an intraperitoneal accumulation, which, taken in connection with the clinical histories, made the diagnosis of ruptured ectopic pregnancy wellnigh a certainty, but neither of the surgeons in question had even so much as suggested the advisability of making a vaginal examination.

These instances are merely mentioned to illustrate experiences of the gynecologist with the general surgeon that are altogether too common. Gross pelvic lesions capable of being recognized by a tyro in diagnosis are overlooked, because the surgeon either detests soiling his hands or fails to appreciate the value of a pelvic examination.

The experienced gynecologist admits without hesitation that his diagnosis of pelvic disorders is not always borne out by what he finds on "section." His errors, however, are usually mistakes of identity with reference to conditions of the same organ or organs and tissues directly associated, but I have never heard of a gynecologist mistaking disease of the gallbladder for a fibroid uterus or an ovarian tumor, or confounding cancer of the colon or of the rectum for a pus-tube, the reverse of which, on the part of general surgeons of recognized standing, have come to my own notice, not in single instances, but a number of times.

The space at my command will not permit me to pursue this interesting subject any further, but in closing I desire to repeat that the practice of gynecology is not all surgical, and that that which is surgical is more readily recognized and the necessary operative work is usually best done by those who are engaged in the daily examination of patients by digital and bimanual methods and who have mastered the intricacies of a proper technique in pelvic and abdominal surgery adapted to gynecological cases.

Gynecology as a specialty still lives.

JEFFERSON MEDICAL COLLEGE

Department of Obstetrics

TAMPONING THE PUERPERAL UTERUS

By GEORGE A. ULRICH, M.D., Philadelphia .

Assistant Demonstrator in Obstetrics, Jefferson Medical College; Clinical Instructor in Out-patient Obstetrics, Jefferson Medical College

THE tamponing of the puerperal uterus immediately after labor and during the puerperal period is a procedure of great importance, not appreciated by the average practitioner of midwifery, and seldom by the specialist.

In looking up the literature on the subject, I find that most of the material written is confined to its use in the treatment of post-partum hemorrhage; this, with the exception of its employment in the presence of infection, of course is its main office in the present status of the procedure as used by most professional men of to-day.

The object of this article is not to write along the narrow limits laid down, but to take a wider, more liberal, and in my opinion a more practical, view of the matter.

In the work at the Jefferson Maternity we have had no case of post-partum hemorrhage for some years, and we attribute this solely to the fact that we believe it easier to prevent this unpleasant occurrence than to treat it when it actually takes place. Acting on this principle, we are in the habit of tamponing all those cases in which there is the slightest danger of post-partum bleeding taking place. In this, then, we have our first and most frequent indication for the packing of the puerperal uterus.

After all labors the uterus is grasped through the abdominal wall, and held so as to prevent any relaxation. Should the uterus show a marked tendency towards relaxing, or should there be a steady stream of blood, however small, coming from the uterus, we act at once, and give the patient a hot intrauterine douche and pack the uterus and vagina with gauze. In this connection there are several classes of cases that demand the packing, even if the womb does not show a tendency to relax immediately after labor, but in which the uterus is in such a condition that it is likely to do so at any time during the early puerperium. These cases are illustrated by instances of twin pregnancy or polyhydramnios, wherever there has been overdistention of the uterine muscle during pregnancy. Another class that is subjected to the same care in the preventive treatment of bleeding following labor is that of those multipara who have borne children in rapid succession, and in whom the abdominal and uterine walls are relaxed and in an atonic condition. In addition to these, we have very frequently packed the womb of those patients who go through labor suffering with some acute disease as a complication, and all cases delivered under deep anæsthesia.

Should we get a case of active post-partum hemorrhage, the uterine tampon would be the main thing in the treatment, as well as the prevention of its recurrence. As I am not considering the treatment of hemorrhage following labor, I shall not describe its treatment in detail; but in order to state definitely the part the tampon plays in the treatment, I will say that the outline of the treatment would be: To rub the uterus gently until it contracts, and then to grasp and hold it; to give ergot and strychnia hypodermically; to give a hot intrauterine douche, removing the blood-clots; and to pack the uterus and vagina with gauze; this followed by the necessary treatment of shock and loss of blood, with later treatment of consequent anæmia: the chief part of the treatment being the tampon.

Acting on the same principle, we have always considered it better to prevent than to try to cure septic infection; therefore, whenever we suspect any infection from existing symptoms, in all cases of abortion, or in those cases where the hand or any instrument is passed into the uterine cavity, as in cases of version, craniotomy, high application of forceps, or the induction of labor, the uterus is invariably tamponed.

Following these indications for packing, there were packed, in our service during the last five years, 163 cases. Of these, there were only 59 cases in which the temperature went above 100°, and 104 cases in which it never reached that point. Of those that went beyond 100°, 20 were higher only before the packing was removed, usually at the time of insertion; 18 after the removal of the gauze; and 21 registered above that point both before and after. Of these 59 cases, 23 went above 101° and 15 above 102°. This is taking into account all cases, no matter what the cause of the rise in temperature. The cause of the rise in temperature was attributed to constipation or some phenomena connected with the establishment of lactation in 45 of these cases, and the only treatment was to open the bowels thoroughly. In four cases it followed severe attacks of eclampsia; in one or two it was the result of abscesses of the breast; and in the remaining nine cases there was an infection; seven of these were infected before admission, as they were admitted in labor, and the chart showed a high temperature curve from the first day; the remaining two may or may not have been infected before labor, but as the indication for the tamponing was a suspected infection, it is fair, at least, to say that the infection was not due to the packing.

The method of packing the uterus is one of choice. The packer made expressly for the purpose may be used. By this method the gauze is placed in the uterine cavity without coming in contact with any object after it leaves the receptacle containing it. By the other method the gauze may be packed into the uterine cavity by means of the uterine dressing-forceps. The former method has the advantage, already named, of keeping the gauze from coming in contact with any part of the vaginal tract or any external object, but it adds another instrument to the obstetrician's armamentarium, which is already quite bulky, and as it can be dispensed with, we prefer to do so by using the latter method, which, if properly carried out, is quite as aseptic as the former.

The method, in detail, is as follows: The patient, being in the lithotomy position, with her buttocks at the edge of the bed, is given a vaginal douche of one-per-cent lysol solution, if the packing is done for any of the indications, excepting relaxation and hemorrhage; or when it is done after an abortion followed by a curettement, in these cases the douche is allowed to be given intrauterine. The obstetrician then passes the index and middle fingers into the vagina, while an assistant or a nurse presses the uterus downward and backward by making pressure on the fundus above the pubic bone; this brings the cervix near the vaginal outlet and straightens the uterovaginal canal; the operator then allows the two fingers in the vagina to slip into the cervix and lower uterine segment, and with the thumb and ring finger the vulvæ are separated as with a speculum; the gauze is then held in a sterile towel close to the vulvar outlet and grasped close to the end with the dressing-forceps; this is carefully carried into the vagina over the hand, and, entering the lower uterine segment, the packing hand is lowered so that it may enter the uterus with more ease. The gauze is carried to the fundus and dropped. The hand over the abdominal wall should be able to appreciate the force of the forceps. The forceps are then withdrawn until the points come down as far as the ends of the fingers, when the gauze is again grasped and carried upward. This is repeated as often as necessary to fill the uterine cavity. In no case should the forceps be entirely withdrawn to grasp the gauze, for by so doing the packing doubles on itself, and the result will be unsatisfactory; besides, considerable difficulty may be experienced in again entering the cervical canal.

When the packing is done for threatened relaxation, or after an abortion, when there may be some of the membranes to separate, the gauze need not be put in very tightly; but when it is done to prevent bleeding, after any of the forms of placenta prævia, it must be put in as compactly as possible. The reason for this is that in the former case all that is desired is the stimulation of the uterine muscle to contraction, and in the latter the uterine sinuses on the lower uterine segment must be plugged.

The gauze must be carried to the fundus of the uterus in order to prevent the formation of a blood-clot above the packing. Iodoform-gauze, five or ten per cent, is the best, as it is entirely non-toxic and unirritating. In no case have we had any untoward results from its use.

Bichloride gauze is absolutely contraindicated, as there may be enough absorption from the uterus to cause well-marked symptoms of mercurial poisoning. In the hospital work the gauze is put up in rolls a yard wide, and whenever the uterus is packed, a strip from four to six inches wide is cut from it and used. One or more of these pieces may be required. The end of each piece of gauze is left projecting from the cervical canal. Whenever the uterus is tamponed the vagina must also be packed with gauze, but the material used in this part of the canal should be antiseptic. Bicholoride gauze has been found best, in our experience.

In the out-patient work, strips of gauze of sufficient length are supplied in the outfit. Johnson and Johnson have prepared gauze for this purpose.

To facilitate removal, the ends of the iodoform and the bichloride gauze are tied together, so that the entire packing is withdrawn in one piece. The gauze is removed in from thirty-six to forty-eight hours, and an intrauterine douche of one-per-cent lysol given. This douche must be copious. At least a gallon of solution should be used.

In conclusion, it is safe to state that even those who may criticise us for packing too frequently must admit that any procedure is justifiable that enables an institution to run a large service, both in hospital and outdoor practice, for a number of years without the occurrence of a single case of post-partum bleeding, and with only two cases of infection that cannot be definitely said to have been infected before admission, and these probably infected; for that was the indication for packing.

I believe that the procedure is demanded in the cases that show any of the indications enumerated above.

JEFFERSON MEDICAL COLLEGE

Department of Bacteriology

A BACTERIOLOGICAL AND HISTOLOGICAL STUDY OF ORGANS REMOVED FROM TUBERCULOUS SUBJECTS

From the Laboratories of the Jefferson Medical College Hospital

By RANDLE C. ROSENBERGER, M. D., Philadelphia

Assistant Professor of Bacteriology, Jefferson Medical College, Philadelphia; Director of the Clinical Laboratory of the Philadelphia Hospital

MOST of the material collected for this report was obtained from cases which came to autopsy at the Henry Phipps Institute during the writer's service there as pathologist.

The cases, with but one or two exceptions, were instances of chronic ulcerative tuberculosis, some with small and others with massive cavity formation.

The object in studying these organs was more for personal gratification than for general information, but the findings were so interesting that a presentation of the work does not seem improper. The general idea is gaining ground that when a person is affected with pulmonary tuberculosis the bacilli are spread broadcast by means of the blood or lymph, or perhaps both, when they lodge in different organs, bringing about a general systemic or visceral infection. This view seems almost positively borne out by the results of the studies about to be recorded.

The organs studied were the heart, liver, spleen, intestines, appendix, thoracic duct, and blood-vessels. The tissues were all infiltrated with paraffine; stained for histological study with hæmatoxylin and Van Giesen, and for tubercle bacilli with carbol fuchsin, followed with the mixture of sweet spirits of niter and saturated alcoholic solution of malachite green.

Of 62 livers, 20 were diagnosed macroscopically as fatty infiltration, 18 as chronic or pas-

sive congestion, 2 showed miliary tuberculosis, 1 calcified tubercles, while 2 showed amyloid infiltration. The remaining 19 organs did not show any appreciable pathological change, yet sections were stained with quite surprising results. Fifty-two livers, or 83.8 per cent, showed miliary tubercles. Some of these histological tubercles consisted only of lymphoid elements, others contained typical giant and epithelioid cells, and others showed caseation. It will be noticed that, upon gross examination, tuberculosis was diagnosed only three times. The tubercles were situated deeply in the parenchyma, and none were found in the capsule of Glisson. As regards the intralobular or interlobular distribution, the tubercles were equally scattered. No organ showed any marked degree of increase in connective tissue, though a few showed apparently newly formed bile-ducts.

Forty-two organs studied for the presence of the tubercle bacillus gave a positive result in 41 per cent.

Citing a few authorities as regards the relative frequency of tuberculosis of the liver, Barthez and Rillet (1) found tubercles in the liver in 71 out of 312 tuberculous children. Williglk (2), in 476 autopsies of both adults and children affected with tuberculosis, found the liver involved in 19. Widl (3) found nuclei and the remains of hepatic cells loaded with pigment in softened tubercles, and frequently observed the tubercles colored yellowish in the center. Frerichs (4, *a*) mentions that tubercular deposits in the liver at one time assume the form of gray, transparent tubercles the size of millet seeds, and at another that of yellowish nodules, varying in size from "a lentil to a pea." They may be distributed more or less uniformly throughout the parenchyma, but are most frequently situated beneath the capsule. Softening of these tubercles terminating in the formation of small vomicæ rarely occurs, and is never so extensive as to give rise to local or general derangements, like those which result from pulmonary phthisis. Barthez and Rillet mention a case of cirrhosis associated with tuberculosis reported by Tonnelé, where its existence (tuberculosis) led to the diagnosis of cirrhotic contraction of the liver. Small vomicæ, Frerichs maintains, must not be confounded with cysts which are produced by tuberculous disease of the ducts. This condition, recognized by Rokitansky, Barrier, and Barthez and Rillet, is characterized by masses of tubercle deposited around the bile-ducts, the channels of which become more and more narrowed.

As regards amyloid change in the liver, Frerichs (4, *b*) claims that the affection rarely accompanies tubercle of the lungs and intestines.

Ullom (5), in a study of the liver in tuberculosis, records results of examination of 37 cases. Fatty infiltration occurred in 24 per cent, amyloid infiltration in 11 per cent, and only 2 organs showed an absence of passive congestion. In 30 cases, tubercles were demonstrable in 21 typical and in 9 atypical; 7 showed newly formed bile-ducts, and in 1 of the 7 there was a coincident increase of connective tissue; tubercle bacilli were observed in only 6 cases.

Pernice (6) found that the liver in tuberculosis shows certain alterations which resemble those occurring in other infections in man, and consist of a vacuolation of the protoplasm, fragmentation and destruction of chromatin, ending in a complete disintegration of the nucleus and of the cell protoplasm, so that in the place of a cell there remains only a network of residual tissue. The necrotic process is most common about the tubercles and in the neighborhood of arteries and veins, and is more extensive in cases of miliary tuberculosis, which Pernice thinks are due to special bacterial poisons.

No such changes in the liver as those described by Pernice were noticed by the writer. Besides the tuberculous changes described, fatty infiltration was observed in 32.2 per cent, passive congestion was noticed in 52 per cent, and only 12 per cent showed amyloid infiltration.

The spleen was diagnosed as tuberculous, macroscopically, in but two cases, while amyloid infiltration was recognized nine times. In seven instances accessory spleens (splenculi) were encountered. These varied in size from 5 mm. to 2 cm. in diameter, were mostly globular, usually single, and attached by a short pedicle. Microscopically, 97 per cent of

the spleens showed tubercles, while in 54 per cent tubercle bacilli were demonstrated. Even the splenculi showed histological tubercles.

In studying tuberculosis of the intestinal tract in this series of cases (62), no lesions of the œsophagus, stomach, or duodenum were ever noticed. The ileum, however, was quite frequently involved, as well as the appendix. Three cases of perforation of the small intestine were observed. Thirty-six instances of tuberculosis of the intestines were met with. Of these, there were 16 in which the small and the large intestine were both involved, 9 in which the small intestine and the appendix were diseased, while 11 showed disease of the appendix alone. The lesions in the appendix were either distinct ulcers or miliary tubercles. One appendix presented the appearance of an acute catarrhal process. The remainder (10) were tuberculous, as proved by microscopical findings. In over 25 per cent, tubercle bacilli were found in the appendices examined bacteriologically.

Kelly (7) considers tuberculosis of the appendix as one of the greatest of rarities, and asserts that it may be doubted whether any well-authenticated case of primary tuberculosis of the appendix has yet been recorded. Fenwick and Dodwell (quoted by Kelly), of 2,000 subjects that died of tuberculosis, found that the intestine was the seat of ulceration in 500 (56.6 per cent) out of 883 cases. It was quite exceptional to find the appendix uninvolved when there was disease of the ileocæcal region. In 17 of the cases the appendix was the only portion of the intestinal tract that presented ulceration. Whether or not this ulceration was tuberculous was not definitely determined.

Haubold (8) reports a case of appendicitis in which tubercles were found in the adjacent omentum and the removed organ. No indication of pulmonary involvement was noticed at any time.

A portion of the thoracic aorta and iliac arteries was studied in a number of cases with the idea of ascertaining the effect, if any, of the tuberculous process upon these structures. In twenty specimens no lesions of any kind were demonstrable, and the study was discontinued.

In making studies of the heart muscle, a portion of the left ventricle was always selected. In not one of the 83 cases was there the least suggestion of tubercle formation. Occasionally, a small accumulation of polymorphonuclear leucocytes and lymphoid cells could be seen between the fibers, but at no time were giant cells or caseation encountered. In some sections, fatty infiltration was present, and in other sections what appeared to be a fragmenting process of the myocardium was observed, as well as a beginning fibrosis. Organisms that resembled the tubercle bacillus morphologically and tinctorially were demonstrable in eight specimens. They were quite few in number, and only by examining several sections could two or three bacilli be made out. It seems from the histological study of this organ, in this series, that the only apparent lesion is the seeming fragmentation of some of the fibers and a slight fibrosis.

In a study of the contents of the thoracic duct to determine the presence of tubercle bacilli, 22 cases were studied. The technique was as follows: The duct was dissected from the receptaculum chyli to the point of emptying into the subclavian vein. Both ends were ligated, the duct thoroughly washed in ordinary tap water, then with sterile water, and securely fastened to a block of cork and mopped thoroughly with a small piece of absorbent cotton. With a sterile hypodermic syringe the vessel was punctured and the fluid content withdrawn. Usually, but one or two drops of fluid was all that could be obtained. Spreads were then made in the ordinary way, and stained by the usual technique for tubercle bacilli. In nearly all the spreads the cellular elements were few. In some, cells resembling lymphocytes were very common, while in a few, cells resembling endothelial cells were present. Only in an occasional preparation was a polynuclear leucocyte observed. All of these 22 cases were of the chronic pulmonary variety, with the exception of one case of acute miliary tuberculosis.

In 16 of the cases, or 72.7 per cent, tubercle bacilli were recognized. In most of the positive cases but one or two organisms were found, and these were found only after a most patient and careful search, lasting in most

instances considerably over an hour. Only in one case was a distinct clump of organisms seen, and this clump consisted of more than twenty bacilli. In not one of these cases was tuberculosis of the duct present, not even the slightest degree of thickening being evidenced anywhere along its entire length. In several, histological examination showed some small accumulations of lymphoid cells, but none resembling in any respect true tubercles.

Longcope (9), in 25 cases of tuberculosis in which the process was more or less generalized, found 17 typical instances of generalized acute miliary tuberculosis. In 12 of these 17 cases, the thoracic duct showed a more or less extensive tuberculous process. In one, while there was no tuberculosis of the wall of the vessel, many tubercle bacilli were found in smears from the duct lymph. In one of the four remaining cases in which the duct was normal, there was a primary disease of one epididymis and testicle with organized thrombi in the vesical veins containing caseous masses and tubercles. Of the 23 cases of generalized tuberculosis, 15, or over 65 per cent, showed disease of the duct, or, as in one instance, tubercle bacilli in the lymph from the duct. Of the acute cases, in over 76 per cent the duct was affected. In six instances the generalized process was subacute or chronic, and while large tubercles or caseous masses were scattered in small numbers through the various organs, in only two was there tuberculosis of the thoracic duct. In both, the tubercles were small and occurred sparingly, but in one a few tubercle bacilli were found in smears from the duct. In two other cases the tuberculous process was of a chronic character, and confined to the lungs and peritoneum. Both of these cases presented normal thoracic ducts.

Longcope's conclusions are, that tuberculosis of the thoracic duct is of great frequency in cases of acute generalized tuberculosis; and in certain cases of the acute generalized disease tubercule bacilli may be found in the lymph from the duct, though the duct itself is not the seat of tuberculosis. In a small percentage of cases of subacute or generalized tuberculosis, the duct may also be affected. Quite a number of observers — Weigert, Koch, Stilling, Benda, Brasch, and others — quoted by Longcope have found tuberculosis present in the thoracic duct in cases of acute miliary tuberculosis.

Silbergleit (10), in a number of cases of tuberculosis gone over for four years, claims that in 95 per cent tubercles of the vessels or of the thoracic duct were found which had permitted the bacilli to gain the blood-stream.

In conclusion, I wish to thank Dr. L. J. Spivak and Undergraduate W. C. Wood for assistance in sectioning and staining the different organs.

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IRRIGATION AND DRAINAGE OF THE SEMINAL DUCT AND VESICLE THROUGH THE VAS DEFERENS[1]

By WILLIAM T. BELFIELD, M. D., Chicago
Associate Professor of Surgery (Genito-urinary), Rush Medical College

THE vas deferens can easily be brought by the fingers against the skin of the scrotum and held there by a half-curved needle passed through the skin under the vas. A half-inch incision through the skin and envelopes of the spermatic cord — painless under local anæsthesia — exposes the vas. A transverse or longitudinal incision into the vas opens its canal. The blunted needle of a hypodermic syringe can be passed into this minute canal and a watery solution of any desired agent injected. This liquid traverses the vas and the ampulla, and distends the seminal vesicle.

This operation, and its utility in the treatment of gonorrhœal and other pus infections of the seminal vesicle, was presented by me to the Chicago Medical Society and described in the *Journal of the American Medical Association*, April 22, 1905. Further experience has improved the procedure and widened its scope. When deemed necessary, the vas is stitched to the skin by a fine silkworm-gut suture, which passes through the lumen of the canal at each cut surface. Thus a fistula is maintained so long as desired; and through this fistula the vas and vesicle may be injected daily. Moreover, the vas serves as a drainage-tube for the ampulla, which drainage may be facilitated by passing a fine silkworm or horsehair thread along the vas to the ampulla, where it is left until removed for the next injection.

By this procedure, direct, repeated, and successful medication of the vas, ampulla, and seminal vesicle is for the first time made possible, and without a serious operation. I have usually made the operation in my office, often unassisted, the patient walking away at its conclusion and losing no time from his vocation.

Irrigation and drainage of the seminal duct and vesicle I have found to be invaluable in the treatment of the following conditions:

1. Chronic gonorrhœal infections of the seminal canal (vesiculitis), with or without a gleety discharge.

2. Chronic pus infections of the seminal canal in the middle-aged and elderly, usually mistaken for enlarged prostate.

3. Recurrent epididymitis, which results from repeated invasion of the epididymis by an infection persistent in the seminal vesicle.

4. Acute gonorrhœal spermatocystitis. In this and in other severe infections, incision into the vesicle from the rectum with the galvanocautery is sometimes desirable for the immediate relief of severe symptoms. Liquids injected into the vas then escape into the rectum.

In two cases of acute gonorrhœa which presented the symptoms usually preceding extension to the epididymis, including pain and tenderness in the inguinal canal, the vas was opened and injected with argyrol solution. No epididymitis occurred, but further experience must determine the possibility of averting gonorrhœal epididymitis by this simple procedure.

In one case of tuberculosis of epididymis, vesicle, and prostate, the vas and vesicle were irrigated with carbolic acid solution — after Rovsing's method for vesical tuberculosis — without appreciable benefit.

The first injection into the vesicle should not exceed thirty minims; a larger amount may cause painful contractions of the vesicle — spermatic colic — and retention of urine, both of which effects I witnessed in my early work. As the inflammatory swelling subsides, the subsequent injections may be carefully increased in quantity.

The fistula is easily closed and the lumen of the vas preserved in this way: At the operation, a fine silkworm-gut suture is passed through the lumen of the canal at each cut surface and out through the wall of the vas a quarter-inch or more distant from this cut end. One suture

[1] Abstract from Proceedings of the American Association of Genito-urinary Surgeons, June, 1906.

end is then passed through the skin and the two ends tied loosely outside. (This suture also serves to guide the needle during the daily injections.) When closure of the fistula is desired, this suture is tightened so as to approximate the cut surfaces of the vas, and is removed when the wound is healed.

That the lumen of the vas is thus maintained even when complete section of the vas has been made, I have witnessed on dogs and in one human subject. A young man, who had lost one testicle as a result of gonorrhœa three years earlier, came for treatment for a recent gonorrhœa, with tenderness in the inguinal canal, fearful of losing the remaining testis. Complete section of the vas was made, a suture introduced in the manner described, and the vesicle injected. The anastomosis was made a week later by tightening the suture. His semen, examined nearly six months later, contained abundant spermatozoa.

These observations have led me to make complete section of the vas whenever — as in averting or treating epididymitis — a mere incision seems less efficient.

The infections of the seminal vesicle and vas constitute a neglected field; for the symptoms caused by spermato-cystitis — pyuria, frequent and painful urination, even complete retention of urine — are generally referred to the bladder and the prostate, and treated as cystitis and prostatitis. If the subject be above forty years of age — and spermatocystitis is common after that period — he is charged with harboring an enlarged prostate and advised to submit to prostatectomy. These are the cases that were temporarily benefited by resection of the vas deferens when that operation was popular.

By my method, these very important, because very common, ailments are made amenable to treatment, without danger to the patient or to his sexual function. It is well known that complete occlusion of both seminal canals, as by double gonorrhœal epididymitis, does not impair sexual desire or capacity, through preventing the passage of spermatozoa into the urethra; and my operation does not even occlude the vas.

The suppurating seminal vesicle has been exposed and drained through an extensive perineal incision, similar to that for perineal prostatectomy. This operation, first practised by Dittel and recently modified by Fuller, is severe and bloody, entailing risks and requiring weeks of confinement. It seems justified, if at all, only in cases of perivesiculitis. The method that I have devised, with or without a cautery inision from the rectum, suffices for the treatment of the vesicle, as well as the ampulla and vas.

JEFFERSON MEDICAL COLLEGE

Department of Pathology

LIPOMA OF THE UTERUS

FROM THE LABORATORIES OF THE JEFFERSON MEDICAL COLLEGE AND PHILADELPHIA HOSPITALS

BY A. G. ELLIS, M. D., PHILADELPHIA

Associate in Pathology, Jefferson Medical College; Assistant Pathologist to the Philadelphia Hospital; Pathologist to the Odd Fellows' Home and to the Kensington Dispensary for Tuberculosis

THE uterus is an organ very frequently invaded by new growths. Williams (1), in a study of 13,824 patients of both sexes treated in four large London hospitals because of primary neoplasms, found that 2,649, or 19.2 per cent, of the tumors were of uterine origin. Of these patients, 9,227 were women, and 28.7 per cent suffered from tumor of the uterus. Of the 13,971 tumors analyzed by Gurlt at Vienna hospitals, 4,115, or 29 per cent, were uterine in location. As to the variety of tumor most frequently found in this organ, Williams's series, which may be taken as fairly representative, was made up as follows: Cancer, 1,571; myoma, 883; non-myomatous polyp, 191; sarcoma, 2; cystoma, 2. In this series there is no instance of the type of tumor I report, and other similar statistics attest the rarity of this growth.

According to Seydel's (2) findings in 1903, only four cases of true lipoma of the uterus have been reported, and of these only one compares in size and location with the present specimen. Two of the four were tiny cervical polyps, and a third was a subserous growth the size of a cherry-stone. In addition to these four cases of lipoma, there are on record two of lipomyoma and four of lipofibromyoma. Still another, in Lebert's atlas, is designated simply as adipose tissue. Seydel accepts as authentic cases of lipomatous tumors of the uterus only these eleven, rejecting three cases cited by Knox because they were not examined microscopically. Although at least two of the latter appear from their gross description to have been lipomas or lipofibromas, Seydel, for the reason given, is probably justified in excluding them from his list. The cases collated and reported by him are, briefly, as follows. I have verified all but two, which I made no attempt to trace.

Lebert, in his *Atlas of Pathologic Anatomy*, 1857, pictures a uterus containing "adipose tissue." The illustration shows clearly a lobulated fibro-fatty or musculo-fatty tumor imbedded in the uterine wall.

In 1880, Stroinski reported finding a small polyp on the anterior lip of the cervix of a woman of 28 who had been sterile, presumably because the growth acted as a valve to the canal. Removal of the polyp showed it to be a lipoma, and pregnancy subsequently occurred.

Orth, in 1893, merely mentions an almond-sized cervical polyp which proved to be a lipoma.

Brünnings reported, in 1899, a case of lipomyoma the size of a child's head in the anterior wall of the uterus of a woman of 55 years. The tumor was interstitial in location.

Franqué, in 1901, described a lipofibromyoma in a woman of 54. The growth was located as a cervical polyp the size of a pigeon's egg.

In 1901, Knox (3) described in detail a lipomyoma, 10 x 13 x 10 cm. in size, located interstitially in the posterior wall of the uterus of a woman of 62. The symptoms and the findings at operation (hysterectomy) led to the diagnosis of uterine myoma. Further study showed the true nature of the growth.

Merkel, also in 1901, reported two cases. One was an interstitial lipoma the size of a billiard-ball, located near the right tube. The other was a lipofibromyoma the size of an orange, occupying the right half of the body of the uterus of a woman aged 63 years.

Jacobson, in 1902, described a lipofibromyoma found in a patient 68 years of age. The tumor was 8 cm. in diameter, and was situated toward the right side, in the anterior wall of the body of the uterus.

In 1903, Seydel found a walnut-sized lipofibromyoma in the uterus of a woman of 58. It was an interstitial growth in the fundus.

In commenting on Seydel's case, Meyer reports in the same paper a lipoma the size of a cherry-stone found in a patient of 42. This nodule was subserous in location, in the fundus.

The three cases mentioned by Knox and not accepted by Seydel are these:

Lobstein (cited by Meckel), in 1803, described a "fatty tumor" of a uterus, enlarging it to the size of a seven or eight months' pregnancy.

In 1853, Seegar reported a case in a widow of 53. A tumor the size of a child's head protruded externally and was removed by ligation of the pedicle. Macroscopically, it was a fatty tumor traversed by firm fibrous bands.

T. Smith, in 1861, showed to the Pathological Society of London a specimen from a woman of 40. A pedunculated mass the size of two fists projected from the fundus, and proved to be largely firm fibrous tissue. Imbedded in it, and easily shelled out, was a fatty tumor the size of a pigeon's egg.

I have found no cases in addition to those mentioned, hence the number of undoubted cases of fatty tumors of the uterus appears to be but eleven, to which the three just mentioned should possibly be added. Several cases reported by the older writers were clearly instances of fatty degeneration of pre-existing tumors, usually myomas. Even this change is rare, McDonald (4) stating that of 530 cases of uterine fibromyoma reported by Cullingworth, Scharlieb, and Frederick, only seven showed fatty degeneration. McDonald found no instance in 280 specimens, nor did Noble (5) in 278.

The specimen forming the basis of this paper was an autopsy finding in a woman of 60 years, who died in the Philadelphia Hospital July 19, 1906. Her family and previous medical history are recorded as negative, the ailment for which she was admitted and which finally caused her death being cerebral apoplexy. I am indebted to Dr. William Pickett for permission to publish the case. The pathologic diagnosis included fatty heart, arteriosclerosis, chronic endocarditis, and contracted kidneys.

The uterus exhibited a globular swelling occupying the fundus and anterior portion of the body. This was much softer than is usual with uterine tumors, but was regarded as a soft myoma, with possibly degenerative changes in the interior. A median incision through the organ revealed the growth to be a mass of yellow fat showing well the lamellar arrangement common to many lipomas. The spaces caused by partial separation of some of these are shown in the drawing of the

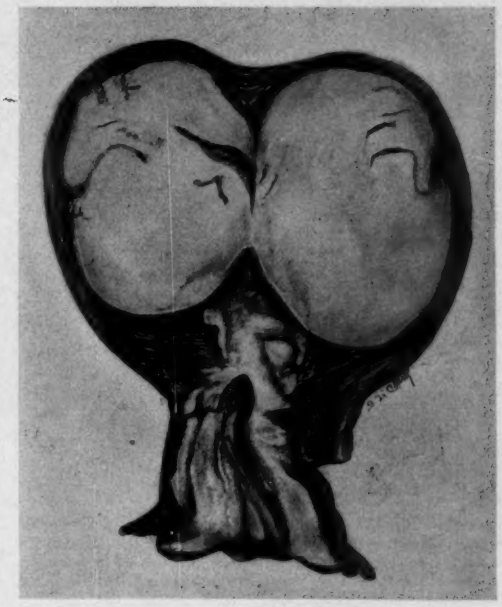

Fig. 1. Lipoma of uterus. One half natural size.

gross specimen. (Fig. 1.) The only suggestion of anything other than adipose tissue in the growth was at one point, near the periphery, where an irregular area slightly more than one centimeter in extent appeared calcareous. Preservation of the specimen by the Kaiserling method has caused this area to become essentially as soft as the surrounding fat. The tumor measured 8 cm. in vertical and 6.5 cm. in transverse diameter. It was interstitial in location, the muscle between it and the endometrium averaging 0.5 cm. and that external 1 cm. in thickness. The growth was easily separated from the inclosing muscle, and possessed what appeared to be a thin grayish capsule, though this structure could readily be detached from both the tumor and the uterine wall.

Microscopically, the tumor shows the structure of a typic lipoma. (Fig. 2.) The fat-cells are round or polygonal in outline, and for the most part much larger than those in normal adipose tissue. The nuclei are crowded to one side and flattened. The blood-vessels are not numerous, and are well developed. The tumor possesses but little fibrous tissue, except at points beneath what corresponds to the capsule, where there are irregular bands passing for a little distance into the adipose tissue; none of them are broad, and all are quite cellular. Bordering the tumor is what may be regarded as a capsule of fibrous or fibro-fatty tissue. This is more dense in the shape of a narrow band immediately surmounting the tumor proper, though even this is quite cellular and contains numerous small vessels. At points this band forms the entire

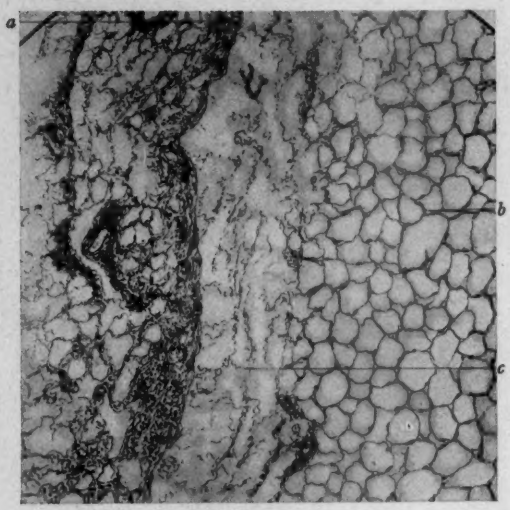

Fig. 2. Lipoma of uterus. Two thirds objective, one-inch ocular. *a*. Inner dense portion of capsule, which, toward the left, contains numerous fat-cells. *b*. Adipose tissue of the tumor. *c*. Partially open space, showing loose attachment of capsule.

boundary, but for the most part there is external to and continuous with this a network of fibrous and adipose tissues from two to three or four times the width of the described band. As a rule, the adipose tissue predominates in this outer zone of the capsule, in some areas being conspicuously in excess. Over part of the extent a very narrow band of fibrous tissue forms the outer limit of this zone, but at many points almost pure adipose tissue constitutes the margin of the sections. In the tumor itself no muscle is present. At points in the capsule there is a faint resemblance to greatly attenuated muscle fibers, but if they are such, which I doubt, they are so altered as to render identification impossible. The tumor, therefore, is a pure lipoma.

Lipomas of the uterus are of pathological and scientific rather than of clinical interest, being found accidentally at operation or at autopsy. As with most tumors, the exciting cause is unknown. The ages of the patients in the series varied from 28 to 68 years. That activity of the uterus has no bearing on the question may also be inferred from the fact that several of the women were sterile, while one had a record of thirteen normal labors and three miscarriages.

As the normal uterus contains no adipose tissue, the histogenesis of these tumors is their most interesting feature. Their rarity is an evidence that unusual conditions obtain when they do occur. Knox considers them as supporting in a limited way the theory of Cohnheim regarding the histogenesis of tumors. Brünnings believes that muscle-cells change into fat-cells, but Merkel failed to demonstrate that these cells change, by substituting fat droplets for their protoplasm, and believes that such metaplasia is not possible. He prefers to regard the tumors as due to hyperplasia of embryonal fat in the uterus. Franqué ascribes the origin of the fat to connective-tissue elements of the uterus, and Jacobson favors the view that similar elements in myomas become fat-cells. According to his view, lipofibromyomas arise from fibromyomas by fatty infiltration of the latter.

Seydel describes degenerative changes in the cells of the stroma, but could not trace the formation of fat-cells from either muscle or connective-tissue elements. He regards as the easiest explanation the view that these tumors spring from lipoblasts dislocated during an early period of development. Lipoblasts are not found normally around the small branches of vessels, but that they might be carried there from the larger trunks is a possibility, as Meyer states that he has seen fat from the parametrium extending into the substance of the uterus along with blood-vessels, but never to any great depth. Seydel is not an extreme partisan of this view. Under such circumstances both elements of a lipomyoma might develop from the walls of vessels if we accept the view that myomas arise from the muscle coat of those structures. Seydel, however, found no relation between the muscle of the tumor and the walls of blood-vessels. As none of these or other advanced theories have been proven, it can only be said that the histogenesis of uterine lipomas is at present unexplained.

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JEFFERSON MEDICAL COLLEGE
Departments of Surgery and Pathology

SACROCOCCYGEAL TUMOR (TERATOMA)[1]

With an Opening Entirely through the Sacrum, and a Sinus Passing through This Opening and Communicating with the Rectum, the Sinus Resembling a Bronchus

By W. W. KEEN, M. D., LL. D., Philadelphia
Professor of Surgery, Jefferson Medical College

AND

W. M. LATE COPLIN, M. D., Philadelphia
Professor of Pathology, Jefferson Medical College

SURGICAL REPORT

By DR. KEEN

HELEN W., aged 2 years, was first seen on October 1, 1902. When born, a moderate sized tumor was noticed in the lumbosacral region. The tumor has grown considerably, so that now its dimensions are 21 x 12 cm., and 5 cm. in thickness. (Fig. 1.) There is a slightly developed hypertrichosis over a considerable area, suggesting a spina bifida occulta. Just below its center there is a small fistulous opening in the skin, but no inflammatory redness around the opening. The mother is quite sure that on two or three occasions, when she gave the child an enema, the fluid escaped from the rectum through the small opening. In addition to that, she thinks she has observed more than once a fæcal odor. There is a very small amount of constant mucous discharge. There has never been any attack of illness with discharge of pus from the rectum which could be interpreted as the bursting of an abscess posterior to the rectum by which the opening in the rectum could have been established after birth. It is therefore reasonable to conclude that the complete sinus was congenital. No other deformity exists.

October 6, 1902. In order to make a careful examination, I etherized the child to-day. Posteriorly, in spite of the difficulty caused by the large tumor, I was able to feel, though somewhat obscurely, the edges of an opening in the sacrum just above the fistulous opening. On inserting a finger into the rectum, I readily found an opening in the sacrum anteriorly, an opening which would admit the end of my forefinger. A probe, which could be introduced 6 cm. into the fistula, but no farther, could be felt through the posterior wall of the rectum, but at no point was I able to detect any communication with the gut by this stiff metal probe, though I suspected its existence. I determined, therefore, to use a liquid flexible probe, i. e., an enema of salt solution. Almost instantly the fluid began to flow through the fistulous opening. It was clear, therefore, that there was a perforation completely through the sacrum, and that the fistula passed directly through this perforation in the bone from the rectum to the skin.

As the tumor was growing, I recommended immediate operation, with the view of closing the fistulous opening as well as removing the tumor.

OPERATION

November 4, 1902. I decided to isolate the fistulous tract (identifying it by means of a

Fig. 1. External appearance of the tumor. Notice the opening of the fistula and the moderate hypertrichosis.

[1] Read before the College of Physicians of Philadelphia, October 3, 1906.

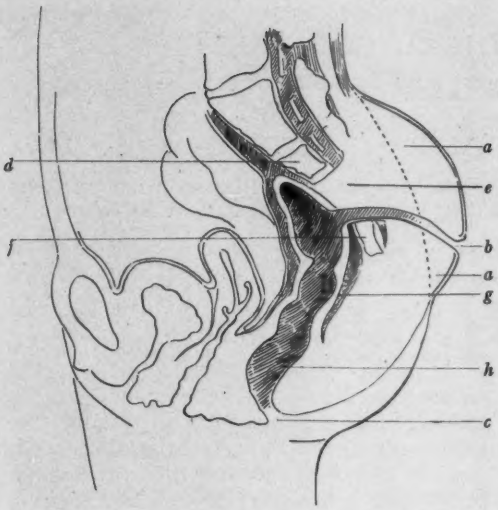

Fig. 2. Diagrammatic scheme intended to show the supposed relation of the tumor, sinus, spine, and the rectum. *aa*. Tumor. *b*. Mouth of sinus, communicating with the rectum. *c*. Anus. *d*. Second sacral vertebra. *e*. Defect in sacrum. *f*. End of sacrum. *g*. Retrorectal connective tissue. *h*. Rectum.

probe passed into it and kept in place) so that it would be like an appendix, and then after removing the tumor, to attempt to invert the tubular sinus as one would the stump of an appendix. Accordingly, I made a transverse elliptical incision, inclosing the fistulous opening. I then dissected back the flaps of skin to the periphery of the tumor. Beginning at the margin, I separated the tumor from the tissues anterior to it by blunt dissection, and was able to recognize readily the normal tissue, even the normal fat, as distinguished from the abnormal fatty tissue of the tumor, and to dissect the tumor from the deep fascia all around, until the fistula was left as a sort of pedicle. When I had dissected the tumor nearly to the fistula, I readily discovered the opening in the posterior wall of the sacral vertebræ. Having separated everything down to the fistula, I then dissected this out, leaving it protruding about 2.5 cm. posterior to the sacrum. On cutting it across I found it to be a tube of considerably larger caliber than the opening in the skin. The external opening would barely allow an average sized pocket-probe to enter. The caliber of the tube internally was about 4 to 5 mm., and clearly lined with mucous membrane. On account of the rigidity of the wall of the sinus, however, I succeeded very imperfectly in inverting it, but after closing it with sutures as well as I could, I tied two ligatures of silk around it, in the hope that the resulting raw surfaces would adhere sufficiently to close the tube.

Next I examined the spina bifida. I found its upper posterior margin was at the second sacral vertebra. It measured vertically about 3 cm. and in width about 1.5 cm. No relation of the sinus to the spinal cord or to the subdural space was evident. On the contrary, instead of being lined with endothelium, it was lined with an epithelial mucous membrane. Fig. 2 represents diagrammatically the anatomy of the parts in section. A small bit of iodoform-gauze was packed over the site of the stump of the sinus. Only three or four ligatures were required, chiefly to a few large veins which emerged through the opening of the spina bifida. What relation the sinus held to the spinal cord I could not determine, saving that it did not communicate with the subdural space. The wound was now closed with interrupted sutures and dressed with suitable pressure-pads to eliminate any dead space.

After the operation, her temperature rose to 102.8°. It gradually fell to the normal by the sixth day, but from that time on for two weeks varied between 99° and somewhat over 100°. The margins of the flaps sloughed for nearly a centimeter in the center. This was followed, naturally, by a slight local infection. Undoubtedly her persistent slight rise of temperature was due to that. The wound healed slowly, and was not entirely well till January, 1903. The sinus at first gave no trouble, and was apparently completely obliterated. It soon, however, reopened and persisted. The specimen was given to Dr. Aller G. Ellis, whose report is appended.

PATHOLOGICAL REPORT ON THE FIRST SPECIMEN

By ALLER G. ELLIS, M.D.
Associate in Pathology, Jefferson Medical College, Philadelphia

SPECIMEN. Fatty tumor removed from sacral region.

The specimen, received in ten-per-cent formalin solution, is an ovoidal mass of tissue 15 cm. in length and possessing a maximum width of from 6 to 7 cm. It

is 3.5 cm. thick and weighs 147 grams. The specimen presents for description two surfaces and a margin.

The first surface (Fig. 3) is convex in shape, and is made up wholly of fat, except at one point. (Fig. 3, *A*.) At this point, which is about equally distant from the ends of the specimen and near one margin, is situated a narrow strip of skin 4.5 cm. in length and having a maximum width at the middle of 0.8 cm. It tapers to a point at each end. Two centimeters from one end, and very near one edge of this strip of skin, is a depressed area surrounding an opening about 0.3 cm. in diameter. The margin of this opening is formed by infolded, wrinkled skin which is brownish in color. Projecting from the margin are a few short, bristly hairs. A probe passed into this opening traverses a sinus about 2.5 cm. in length and emerges on the second surface at a point shown in Fig. 4, a short distance from a cyst to be described later.

The second surface is concave in general appearance, this being especially true of one half, the depression in the other being partially filled by a projecting mass of tissue, the most prominent portion of which is on a level with the edges that limit the concavity. This surface is also formed mostly of fat, but shows here and there small areas of muscle. At a distance of 7 cm. from one end, practically the midpoint of the specimen, and 2.5 cm. from the margin nearest the piece of skin on the first surface, is situated what is apparently a small, thick-walled cyst (Fig. 4, *B*) that has been divided into two unequal parts by an incision that extends almost through it. The incised surfaces of this cyst are approximately circular in outline, the larger being 1.2 cm. in diameter. The surfaces are grayish in color, have a glistening appearance, and are moderately cupped, showing that the concavity of the cyst had been small. On removing the smaller part for microscopic study, the knife encounters what is apparently cartilage, and investigation shows that the greater portion of the wall, which is quite thick, consists of that tissue, the soft lining being very thin. Underneath the cyst, and extending for some distance into the projecting mass described, is an area that is shown by puncture to have this same cartilaginous consistence. Toward

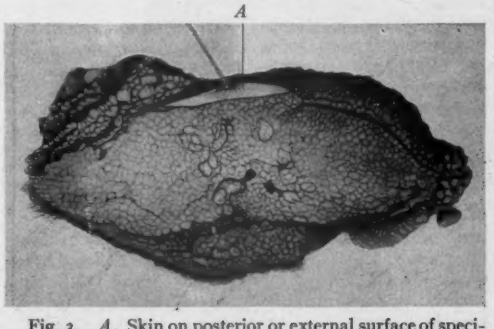

Fig. 3. *A*. Skin on posterior or external surface of specimen after removal. Just below the leader from the letter *A* is a probe engaged in the sinus, the direction of which is thereby shown. One third size. From Report 2002.

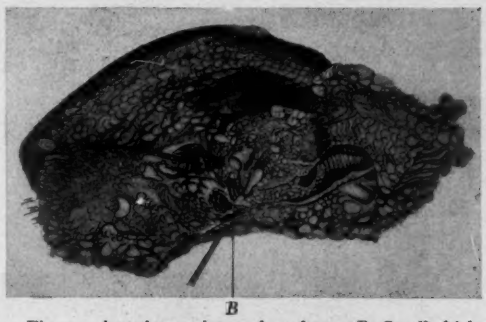

Fig. 4. Anterior or internal surface. *B*. Small thick-walled cyst. The internal opening of the sinus contains the tip of a probe inserted from the opposite end of the sinus shown in Fig. 3. One third size. From Report 2002.

the opposite extremity of the projecting mass is an irregular, trough-like depression about three centimeters in length, one side of which shows a number of narrow, transverse folds or rugæ. The tissues of this area have the same general appearance as the other superficial portions of this surface. Less than one centimeter from the cyst is the opening of the sinus previously referred to. This opening is surrounded by an irregular mass of muscle and fat which practically obscures it when the probe is withdrawn.

A piece of tissue 1.5 cm. long and wide, removed from the specimen in such a way as to include a part of the sinus near its middle portion, shows it to be bounded by a clearly defined, rather dense wall slightly more than 1 mm. in thickness.

The margin of the specimen is fairly regular in outline, is formed by the junction of the two surfaces described, and presents nothing worthy of note.

The piece of tissue including part of the sinus, to be known as *A*, and the removed portion of the cyst *B*, were hardened in alcohol, infiltrated with paraffin, and sectioned. Sections from each were stained by the usual laboratory methods, and on microscopical examination they show the following histological structure:

A. The wall of the sinus is composed of smooth muscle, fat, and fibrous tissue, the latter being arranged, for the most part, as a band surrounding the sinus. The lining of the sinus is of two distinct types:

1. The greater portion is formed of many layers of epithelial cells, the superficial being thin and of the squamous variety, the deeper layers being more polyhedral in shape. In some parts the squamous layers are practically all that are present. In others, a few of the deeper layers are of the polyhedral type, while at a few points the polygonal cells are very numerous, dipping down, and giving the structure a resemblance to normal skin. At these points, however, a rather indistinct structure resembling a basement membrane is present. The deeper cells present no special characters distinguishing them from those more superficially placed. Many of the superficial layers possess the usual microchemical reactions of keratohyalin.

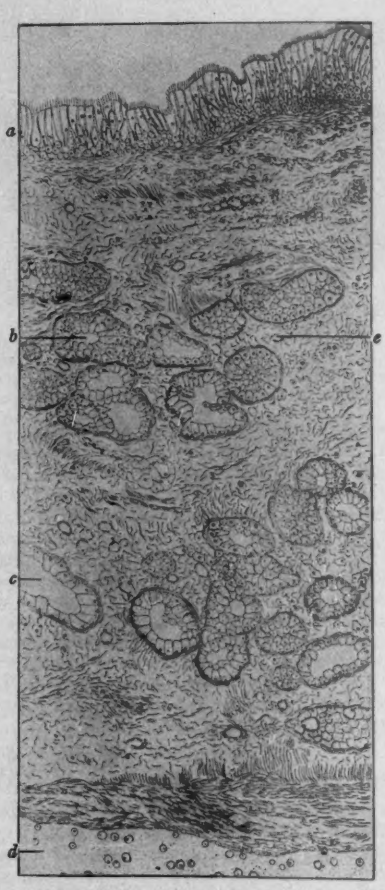

Fig. 5. Section of cyst-wall. Showing trachea-like structure in tumor. *a*. Ciliated epithelium. *b*. Gland. *c*. Gland. *d*. Cartilage. *e*. Vessel.

2. At points this stratified squamous epithelial layer changes abruptly, and without apparent change in the underlying tissue, to a layer of tall columnar ciliated cells placed on a fairly well-marked basement membrane. In some of the sections this columnar cell-lining occupies one third or more of the circumference of the sinus; in others, but a small part. Small areas show some desquamation of the columnar cells, especially near the junction of those with the stratified squamous variety. At points these epithelial cells dip down, forming either tubules or the openings of glands. (Fig. 3, *A*.)

Immediately beneath the epithelial lining of the sinus is a zone, varying in width, of loose areolar tissue, very rich in cells, of the mononuclear or lymphoid type, and of various sizes. At a few points, collections of these cells extend for some distance into the underlying tissue. The densest accumulations of them are situated beneath the columnar cell areas described, and at two or three points extend through the latter to the free surface, the columnar cells being absent, or displaced or fragmented, as though the mononuclear cells had infiltrated that area.

At one point (Fig. 2, *a*) deeper in the wall of the sinus can be identified two areas of cells that have no apparent connection with those just described. The one area is irregularly circular in outline, and is made up of cells and matrix closely resembling the zone immediately beneath the epithelial lining of the sinus. Several points in this area appear to be cystic, as there are distinctly outlined cavities bordered by the loose areolar matrix, in which the cells of this area are placed. The second area of cells, ovoidal in outline, is closely approximated to and continuous at one point with the first area. The periphery of this area is formed of cells apparently identical with those in the first area, but in the central portion the nuclei are much flattened and elongated, assuming in some instances a spindle shape. Slight, if any, cystic change is present at this point.

The outlying portions of the sections, including the sinus, are made up mainly of muscle and fat. Some of the muscle bundles apparently have been the seat of a degenerative process of some sort, as they present a homogeneous, colloid appearance and manifest unusual tinctorial reactions. Blood-vessels are fairly numerous throughout the wall.

Cross-sections of branched tubular mucous glands are also seen. (Fig. 3, *A*.) As these are identica with glandular elements in the cyst-wall, they will be described later.

B. Examination of sections from this portion of the specimen passing through the entire cyst-wall at once shows it to have a histological structure which resembles in the most striking manner that normally found in the wall of a bronchus. (See Fig. 5.) There are present in succession, from without inward, muscle and areolar tissue, a broad band of apparently normal hyaline cartilage surrounded by its perichondrium, submucosa containing transverse and longitudinal sections of mucous glands, and a distinct basement membrane surmounted in areas by tall, columnar, ciliated epithelial cells. These cells show varying degrees of desquamation, being entirely absent from the greater extent of the surface. At points in some of the sections showing no epithelium, there are on the surface projections or fragments of muscle and loose areolar tissue containing blood-vessels. The submucosa shows some cellular infiltration, and at areas the epithelial cells lining the tubules of the mucous glands are desquamating and exhibit fragmentation.

The glands referred to as present in the submucosa of parts of the sinus and in the cyst-wall are histologically fairly uniform. Sections so fortunate as to show clearly duct openings on the free surface have not been obtained, but dipping-points with changes in the superficial epithelium, such as are usually noted in the mouths of ducts, have been encountered frequently. In the submucosa the glands show lobulation with a varying degree of clearness. In suitable sections such lobules are composed of twenty to thirty or forty units,

each unit being a transverse section of a tube and composed of a membrana propria, upon the inner surface of which is placed the usual glandular epithelium, and beneath which is the interstitial connective tissue carrying the blood-vessels. The epithelium in different areas, or even in different parts of the same tubule, sometimes shows the characters of fully distended secreting cells, while at other points these bodies are empty. In many of the lobules branching tubules can be seen. The intralobular ducts are of the type usually seen in mucous glands.

made because there is some doubt as to this portion of the specimen being distinct from the sinus. Although there is no direct connection between the two in the specimen as received, we are inclined to the view that there was such connection originally. This view is supported, to some extent, by the proximity of the two structures, and more strongly by the presence in the sections containing the sinus of tubular

Fig. 6. Skiagraph of the pelvis. Showing in the middle line, on a level with *A*, the oval opening in the sacrum, and the apparent absence of the lower sacrum and the coccyx.

DIAGNOSIS

The histological findings in this specimen indicate that it is a variety of the congenital sacrococcygeal malformations that include dimples, sinuses, and cysts. The sinus in this instance is lined partly by elements resembling skin and partly by a structure resembling mucous membrane, the formative attempts having proved more or less abortive in each case. The cyst, if such it is, has an almost perfect bronchial structure. This qualifying statement is glands having the same structure as those found in the wall of the so-called cyst.

The point raised is not of great importance, except as determining whether the condition present is that of a sinus and a cyst, or is simply that of a sinus, the so-called cyst being its terminal point. In either case, the teratomatous tendency of these formations is evidenced in this specimen by the different structures lining the sinus and by the presence of a wall presenting the histologic characters of a bronchus.

October 26, 1903. Her general health since the operation, nearly a year ago, has been very good, and she has grown rapidly, but the small sinus which reopened still persists at the site of the original opening. As far as the probe can detect, it is about 3 cm. deep. I advised another operation, believing that most probably, as there had never been any escape of gas or any fæcal odor, but only a few drops of pus each day, it was probably now merely a blind sinus terminating in a cul-de-sac.

SECOND OPERATION

October 29, 1903. Before beginning the operation, in order to determine whether the sinus opened into the rectum, as before, I repeated the maneuver preceding the first operation; i. e., I injected into the rectum a considerable amount of salt solution. Before the first operation, this immediately welled out through the sinus; to-day not a drop appeared, though I injected a much larger quantity than at the first operation.

A probe was first passed as far as possible into the sinus. An elliptical incision was then made transversely above and below the probe, and the tissue all around the sinus dissected out. I finally divided the foot-stalk or pedicle by which it seemed to be connected to the deeper tissues; and after the operation, on splitting open the sinus, I was pleased to find that I had passed about 5 mm. below the apparent end of the cul-de-sac. A finger could be inserted from the back into the opening in the sacrum and felt by a finger in the rectum. No sinus could be detected by the probe or otherwise. The wound healed without any reaction in a few days, and has never reopened.

PATHOLOGICAL REPORT ON THE SECOND SPECIMEN

By DR. A. G. ELLIS

SPECIMEN. Tract of sinus removed from sacral region.

This specimen consists of a small piece of tissue 3 x 3 cm. and 0.8 cm. thick. The surfaces are rough and grayish in color, except a narrow groove near the center, which partially divides the specimen into two nearly equal portions. This area is slightly pinkish in color and a trifle less dense than the surrounding tissue.

The specimen was fixed in ten-per-cent formalin, dehydrated, cleared and infiltrated with paraffin. Sections were cut, and, after staining by the usual laboratory methods, show the following:

The findings, in general, are those described in detail in the report upon the specimen removed from the same patient at the first operation (*vide ante*), though the arrangement of the tissues does not so nearly correspond to that of certain typical structures, bronchi for instance, as in the previous specimen. A small part of the border of some of the sections shows stratified epithelium similar to that of skin, hair follicles, and sebaceous glands, both of which are very rudimentary in type. Other portions of the sections contain small areas of cartilage, in proximity to which are areas of tubules lined by epithelial cells, the latter areas conforming to those of mucous glands. Near these are deep infoldings or tubules lined by columnar epithelial cells bearing distinct cilia. These structures, instead of being placed in proper order to form the histological structure of a bronchus, are scattered indiscriminately in the fibrous tissue which forms the larger part of the sections, none of them, however, being at any considerable distance from the others. Certain parts of the sections contain striated muscle which shows chronic productive interstitial change and atrophy of the fibers.

Diagnosis: Sacral teratoma.

REMARKS

This case is evidently a very rare form of teratoma. The notes and drawings have been submitted to Drs. George S. Huntington and Francis H. Markoe of New York, George A. Piersol of Philadelphia, Professor Martina of Gratz, and Professor Ballantyne of Edinburgh, all of whom concur in this opinion. The skiagraphs were more recently obtained, and have not been submitted to the gentlemen named.

So far as I have been able to search, I have not found any case which is precisely similar to it. It seems to be unique by reason of the sinus, which, beginning at the skin, perforated the sacrum and the spinal canal and terminated in the caliber of the rectum, the sinus itself resembling an imperfect trachea of bronchus in structure.

At the time when the child first came under my care, for certain reasons unnecessary to state I was not able to obtain a skiagraph. Even had I been able to do so, it is doubtful whether it would have been of much assistance, because at two years of age the ossification of the bony structures is so much less advanced than at present. Recently, at six years of age, I have obtained two skiagraphs. Compare these also with Fig. 2. One of the pelvis alone (Fig. 6) shows very well (and, of

course, much better in the original skiagraph than in any reproduction), in the middle line, at the level of the letter *A*, the existence of an oval opening in the sacrum. In the original skiagraph this opening shows quite distinctly

When I examined the child's pelvis by the finger in the rectum at the time of the first operation, I did not suspect the absence of bony development in the lower part of the sacrum and coccyx, nor would it have been suggested

Fig. 7. Skiagraph. Showing the attempted bifurcation of the lumbar spine, and a possible rudimentary arm, on a level with 4, as well as the points noted in Fig. 1. 1, 2, and 3 are placed at the level of the first, second, and third lumbar vertebræ.

an upper and a lower portion, with a slight constriction in the middle, so that it resembles the figure 8, with the cross line in the middle partially obliterated. There is apparently, also, no bony sacrum below the second or third sacral vertebra, and no bony coccyx.

recently, when I re-examined by rectal touch, except for the finding of the skiagraph. Evidently these bones either still consist of quite firm cartilage or else of fibrous tissue so firm as not to have led me to suspect that it was not bone. The fact that the opening is so long

vertically was not discovered, because only the lower part of the opening could be reached by my forefinger. This was engaged by the lower half of the 8, and as I could not reach the upper half of the 8, I did not know that it existed. Even at the recent examination, after I knew the shape and size of this opening, I could not reach its upper portion.

The second skiagraph (Fig. 7) shows this same fibrous tissue, but reveals a second fact of great importance; namely, that the body of the first lumbar vertebra (on a level with 1) is broader than normal; that of the body of the second (2) is still broader; the body of the third lumbar (3) is nearly twice the breadth of a normal vertebra, and shows a marked tendency toward separation into a right and a left half. The bodies of the fourth and fifth lumbar form a confused mass which is very broad, and about in the center is a light space which apparently marks their irregular but complete division into a right and a left half. Just below this is the oval opening already described in the sacrum. Just below the level of the body of the third lumbar vertebra, and on a level with 4, is a dark shadow, which suggests the possibility of an abortive humerus, forearm, and possibly a hand.

In the light of these skiagraphs, examination of the back showed also this great breadth of the lumbar spine (13 cm. at the level of the iliac crests), so that, as will be observed (Fig. 7), the lumbar spine forms a pyramid, the base of which is apparently at the junction with the iliac bones.

The attempted duplication in the spine and the imperfection of the lower sacrum and coccyx may or may not be indicative of any imperfection or duplication in the pelvic organs. The rectum, we know from repeated examinations, is normal, excepting the fistulous opening, which passed from the rectum through the sacrum, the spinal canal, and the tumor to open just below the center of the tumor. Whether the vagina, and possibly also the uterus, either or both, are double is uncertain. In so young a child, of course, I would not be justified in making any vaginal examination.

I have explained the whole matter to the parents, and advised that when she is 15 or 16 years of age, and before the question of possible marriage would arise, she should be reexamined, and if necessary for a thorough examination, she should be etherized. The condition of the vagina and the uterus should be ascertained and the pelvis carefully measured, so that if there is any bar to marriage this should be known and suitable measures taken. Whether the pelvis will develop normally or abnormally, and so influence parturition favorably or unfavorably, would be of the utmost importance to her future welfare.

Dr. Coplin will discuss the case more fully from the pathological and embryological standpoint. Certainly it is a bigerminal teratoma, the duplicated spine representing the imperfect fusion of the two normal centers of ossification of the vertebral bodies, while the tumor, with its curious development of the sinus representing an imperfectly developed trachea or bronchus, and possibly, as shown in Fig. 2, a rudimentary arm may represent a second ovum.

From the surgical standpoint, there are only two points to be considered: 1. Before operation I was in great doubt whether, in order to obliterate the canal leading from the skin into the lumen of the rectum, it might not be necessary to make a considerable opening in the sacrum, and thus gain direct access to the posterior wall of the rectum for the purpose of inverting the opening in this wall. This would have involved great danger of opening the subdural space, with possible injury to the nerves of the cauda equina. 2. A second method of attack I had considered was the perineal route between the sacrum and rectum, practically a Kraske operation.

Fortunately, I did not have to attempt either of these routes, inasmuch as I found, during the operation, that I could dissect away the entire tumor until it was attached only by the tubular sinus as a pedicle or foot-stalk, and I was able to obliterate the rectal portion of the sinus at the first operation; while the persistent distal portion was removed and obliterated at the second operation. Had I failed, the two possible modes of attack above mentioned could have been attempted.

It is now almost three years since the last operation. The child is well developed and healthy. When she walks there is a little

waddling gait, due, I presume, to the unusual breadth of the spine and pelvis, or possibly an instability in the lumbar spine. There has never been the slightest trouble from any fæcal accumulation in what must still exist, — the diverticulum from the lumen of the rectum to the point of obliteration of the tubular sinus at the posterior surface of the sacrum. It is worthy of note, also, that in spite of the large oval opening in the anterior portion of the sacrum, there has never been any tendency to the formation of that rare anomaly, an anterior sacral meningocele.[1]

SACROCOCCYGEAL NEOPLASMS
A SUMMARY

By DR. COPLIN

The sacrococcygeal region shares with other parts of the body in the distribution of new growths. To many neoplasms the area is but slightly liable, and, as in several anatomical fields, is subject to morbid growths in many respects somewhat unlike those occurring elsewhere. In the sacrococcygeal field the common tumors of wide distribution are rare, and the rare tumors of other parts are here more frequent. Of the histoid growths, fibromata, chondromata, osteomata, and lipomata are infrequent; carcinoma and sarcoma, rare; papillomata of various types are probably the most common of the simpler neoplasms involving this region; angeiomata and endotheliomata have been observed. It is not unlikely that the gliomata described have been types of teratoma in which a single element overshadowed other structures. Sebaceous cysts and hygromata, the latter probably of bursal origin, deserve little more than mention.

The important neoplasms of special interest to the practitioner because of their practical importance, and to the oncologist by reason of their histogenesis, are now conceded to be derived from developmental errors frequently arising early in the evolution of the embryo. Perfect evolution of the tissues embraced in this part of the body is beset by many narrow escapes, and the sharply drawn lines which nature must follow render many and varied deviations so easily possible that it is a wonder that disaster is not of more frequent occurrence. It is in this area that the caudad termination of the primitive streak must most accurately attain its evolution and involution, the neurenteric canal develop and disappear, the anus complete the intestinal tube, the posterior fissure properly close, coccyx and sacrum develop, the inferior extremities symmetrically adapt themselves to the trunk, possibly the caudal appendages of our ancestors bud and disappear, and all of these, and other processes of development, must keep uniform pace, so that none may outstrip another in the relatively rapid growth of all the parts involved. Added to these, it must be remembered that in the embryo, within a few millimeters of the area under consideration, is progressing the complicated evolution of the genito-urinary organs, themselves marvels of intricate complexity. Inaccurate coaptation of fissural margins, delayed closure of clefts, ectopia of fragments, sequestration of cell groups, delayed disappearance of structures that normally atrophy, and inclusion of contiguous elements, are possibilities, any one of which constitutes a deviation from the normal, which, later, during intrauterine life or post-natal existence, may jeopardize the well-being of the individual.

Within recent years few groups of tumors have attracted the attention of investigators more than new growths of the sacrococcygeal region; to review, even briefly, any large part of the literature of the subject would exceed the proper limits of this paper. Borst (1) has summarized the known facts and promulgated theories to 1902, and little has been added by the more recent communications of Martina (2), Bartel (3), Chiari (4), Féré (5), Kirmisson and Bize (6), Tedenat (7), Graff (8), and others (9), all of whom have recorded important observations on the subject. Aside from dermoids due to the inclusion of bits of skin, the all-important feature (oncological) of these studies has been the attempted elucidation of the histogenesis of teratomata. The term "teratoma" is here used in a sense similar to "embryoma," preferred by Wilms and others for similar tumors arising in the ovary. The discussion has been warmest over the questions of the monogerminal or the bigerminal origin of these growths, and here — as is often the

[1] Nieberding, *Münch. med. Woch.*, 1904, li, 1384, in an excellent paper, has collected the nine then recorded cases of such an anomaly.

case in medicine — confusion has arisen because of inaccurately drawn distinctions rather than essential differences in opinion. Certainly many of these tumors may be considered monogerminal — that is, they have arisen from a single impregnated ovum. Of course, the simpler inclusion dermoids are of such origin, and a like explanation is reasonable for other cysts or neoplastic masses resulting from developmental errors, excessive hyperplasia of one or more elements, ectopia of contiguous tissues, and similar errors in development.

After the discovery of Kowalewsky, Middeldorpf sought to explain certain of these tumors as arising from structures forming the neurenteric canal, but such an explanation fails in cases where definite organs, or parts of organs, as limbs partly or wholly formed, nerves, parts of eyes, pulmonary structures, renal tissue, mammæ, bone, etc., are present. Tourneux and Hermann attributed the presence of nerve tissue intercallated between epithelial and connective-tissue elements to persistence of medullary coccygeal vestige. Borst suggests that brain-like structures may be of this origin. The view that Luschka's body may give rise to sacrococcygeal growths is now abandoned. None of the origins suggested offer an adequate explanation for the presence of definite organs, or demonstrable parts of organs, in such tumors.

I cannot discuss in detail the views of Marchand and of Bonnet as to the possibilities of such tumors arising from impregnated polar bodies or wandering blastomeres. On the assumption that but two polar bodies are present in most vertebrates, the explanation fails in cases like that recorded by Sänger, in which a single ovary contained five embryomata. The preliminary divisional products of ovular segmentation — blastomeres — at a stage prior to the formation of the blastodermic layers must possess potentialities which, theoretically, and according to Bonnet demonstrably, would be adequate to continued existence and more or less perfect independent development if separated from the original mass. On this theory it becomes possible to conceive that should blastomeres be detached and continue proliferating, they might give rise to a more or less successful attempt at the reproduction of tissues normally developed from properly constituted blastomeres, and in this way give rise to a structure containing the many tissues observed in teratoma. This ingenious explanation of ovarian teratomata — preferably embryomata — has proven very enticing, but falls short of the satisfactory when weighed against the many facts that might be adduced.

The bigerminal[1] origin of many sacrococcygeal tumors is most in accord with the known facts concerning embryology and neoplastic development. It is the commonly accepted explanation, for duplicated or parasitic monsters include the attachment to or implanation of one fœtus upon or within another. This theory places all tumors containing evidence of such highly organized bodies as could best be explained by the assumption that they originated from an impregnated ovum directly in line with the grosser developmental anomalies represented by autosite and parasite. Nearly a half-century ago, Virchow maintained the bigerminal origin of such tumors. In the neoplasms the impregnated ovum runs its course of aborted growth within the tissues of the autosite or host; in the other case it is attached to the otherwise more or less perfectly developed child; in one instance it is represented by the neoplasm, in the other by the parasite.

An interesting field of experimentation considered by Féré, Chiari, and also by Lucene and Legros, is the artificial production of tumors of this type by grafting young chick embryos into the cavities or tissues of hens. Space is not available for detailed discussion of their recorded observations, except to say that a certain measure of success has crowned their efforts; after seven weeks, skin with attached feathers has been found in the abdominal cavity. The grafts have developed carrilage and bone, the latter showing epiphyseal formation. Trachea-like structures, and even retinal elements, have been produced. About one year ago, my associate, Dr. Rosenberger, at my suggestion, began a series of experiments along the line indicated. So far the results have not been encouraging; apparently, they are negative. We hope, however, to re-

[1] For essentially the same purpose, Ballantyne prefers the terms "monosomatous" and "bisomatous" to the terms "monogerminal" and "bigerminal."

port them in detail in the near future. The question of homologous hen and chick, and other factors that need not be mentioned at this time, renders success largely a matter of accident, but failures, in the presence of recorded results, must not be taken as controverting the reported facts.

In the case reported by Dr. Keen the presence of such highly organized structures as trachea and glands, the separation (duplication?) of the sacral vertebræ and the suggestion of a structure — possibly a limb — shown by the X-ray — all point to the bigerminal origin of the growth.

I cannot close without saying something on the question of malignancy. As a rule, these tumors show no tendency to metastasis. Graff, Krukenberg, Montgomery, Czerny, and others have reported dermoids undergoing carcinomatous transformation, but that is something different from a primarily malignant tumor. The earlier writers thought malignancy the rule, and in some cases the microscope has indicated sarcoma; in one instance adenosarcoma, in another adenocarcinoma. Goldschmidt called his tumor a chondromyxolymphadenosarcoma. While complete removal is highly desirable, Phocas, Cazin, and Broca have shown that it is not absolutely necessary, as imperfect ablation may not be followed by recurrence. Thedenat calls attention to the great danger resulting from injury and infection; of the unoperated cases — when the tumor was present at birth — three fifths of the children die before the third year. The location favors injury, and slight trauma is often followed by disastrous infection, which, in turn, is most difficult to arrest. A sudden enlargement may be due to a mild infection that does not frankly manifest itself, and could easily be taken for excessive neoplastic activity. Hoppe states that in but two recorded cases is metastasis suggested, and his investigation of the reports (Beatson, Frank) leads him to discredit either the diagnosis of the primary tumor or the accuracy of the observer. Stolper, and also Calbet, thinks sacrococcygeal growths intrinsically benign. It is well to remember, however, that undescended testicle, supernumerary mamma, and other abnormalities or ectopias, are not infrequently starting-points for rapidly fatal malignant tumors. Excision is clearly wise. Another important point is the recently established relation between teratoma of the testicle and syncytioma malignum, the dangerous character of which is well known. I have one such specimen, the patient dying in a short time after the appearance of symptoms. Scott and Longcope (10), and also Frank (11), have recently recorded such cases.

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JEFFERSON MEDICAL COLLEGE
Department of Gynecology

REPORT OF A CASE OF MUMMIFIED FŒTUS OF THIRTEEN YEARS' STANDING

By P. B. BLAND, M. D., Philadelphia
Instructor of Gynecology in Jefferson Medical College; Assistant Gynecologist to St. Joseph's and the Philadelphia Hospitals

MRS. A. M., aged 34, white, German.

Family History. Mother, one sister, and two brothers living and well; father died of heart disease.

Personal History. The patient was born in Germany, and came to America ten years ago. She was always subjected to hard work. She has had all the ordinary diseases of childhood. Menstruation was established at the age of 14, and was always regular and not painful. It was normal in quantity and duration. She was married at the age of 21, and has given birth to three children. The labors were all normal and unassisted. She has never had any miscarriages. The last child was born twenty months before her admission to the hospital. The patient suffers no unnatural discharges from the genital tract.

The present trouble has, to the patient's knowledge, existed for thirteen years, and is manifested by a tumor in the lower portion of the abdomen. The history preceding the existence of the tumor is indefinite, and not indicative of a ruptured tubal pregnancy. The tumor, previous to six months ago, was not responsible for any distressing symptoms. Six months before her admission to the hospital, however, she was seized with severe pain in the right pelvic region and had repeated fainting attacks. The area over the tumor at this time became quite tender to pressure, and locomotion was impossible. Pain and tenderness lasted for several days, after which it gradually disappeared. From this period to the time of her admission to the hospital she suffered with more or less distress in the abdomen, complaining of pain and a dragging, pulling sensation. She could walk but a short distance without being exhausted, and was unable to discharge her regular household duties.

Physical Examination. Examination of the abdomen revealed a slight protuberance in the right iliac region. On palpation, the mass imparted to the hand a firm, fibroid sensation, but the tumor was not apparently connected with the uterus. The tumor extends to the right of the umbilicus. It is slightly movable, irregularly nodular, and hard and dense in consistency. From the examination, a provisional diagnosis of floating fibroid tumor was made, with the supposition that the mass was nourished by adhesions with the circumjacent structures.

Operation. The patient was subjected to abdominal operation in St. Joseph's Hospital. After entering the abdomen, a large fœtal head sized, irregular mass was revealed. At first inspection, the tumor was thought to be a glandular cyst of the ovary or a fibroid growth of the uterus which had become separated from its uterine attachments. The tumor was delivered through the abdominal incision, and its origin in the right tube revealed. It was found enveloped by the omentum and firmly adherent to the mesentery, from which structure it was with considerable difficulty separated. The pedicle of the mass was serially ligated and the tumor removed. The stump of the pedicle was sutured with a continuous catgut suture. The hypertrophied omentum was ligated in sections, and also removed. A large rent was inflicted in the mesentery in the removal of the growth, and this was also closed with the continuous catgut suture. The abdominal incision was closed with continuous catgut sutures for the peritoneum and aponeurosis, with interrupted silkworm-gut sutures for the skin and subcutaneous tissues. The specimen after removal presented every appearance of being a calcified ectopic gestation. The patient made an uninterrupted recovery, and was discharged from the hospital twenty-five days after the performance of the operation.

Close inspection of the specimen shows the mass to be composed of a variety of tissue. It is apparently enveloped in a dense fibroid sac, and in several areas bone can be distinctly palpated and seen. The hard, fibrous sac surrounding the fœtus is, no doubt, composed of the amniotic membranes blended with the skin of the fœtus. This structure in several areas is hard and stone-like, and is due to the deposition of calcareous salts. In the drawing of the gross specimen herewith presented (Fig. 1) a femur three inches long will be seen, and also a tooth. The outline of the orbital plate of the frontal bone can be distinguished also. The specimen weighed 3 pounds, and measured 7 inches in its longest diameter and 4½ in its shortest diameter. Separation and dissection of the specimen showed it to be composed of the remains of an ectopic pregnancy, and from the fact that the bones and various organs are so far developed it would indicate that the fœtus was *several months* (possibly six or seven) old before death took place; because

it is a well-established fact that fœtuses a few weeks old are usually absorbed. The vertebral column and the cranial bones of the specimen show conclusively that the fœtus was several months old.

The dissected skeleton measured fifteen inches, and from these measurements the age of the fœtus, according to the figures of Schultze, would be about eight months, or the end of the thirty-second week. Schultze's measurements, however, are those taken from the living child, and cannot with accuracy be applied to this case. Indeed, I am fully persuaded that the skeleton of the fœtus in this case was one of a full-term pregnancy. The patient, I believe, went to term (and passed through a spurious labor) without secondary rupture of sac. The amniotic fluid became absorbed, the placenta disappeared, and the fœtus remained and underwent mummification.

It has been demonstrated that when mummification of a fœtus takes place or a lithopædion forms, no trace of placental tissue can be found. Mummification results from the absorption of the fluids, and the soft parts remaining are then converted into hard, dry, leathery tissue.

Bland-Sutton speaks of a case similar to the one I have described, in which the fœtus was removed from the Fallopian tube. The tumor was an irregular flattened mass, 10 cm. long and 5 cm. wide. The woman had carried the tumor more than fourteen years beyond the ordinary period of gestation.

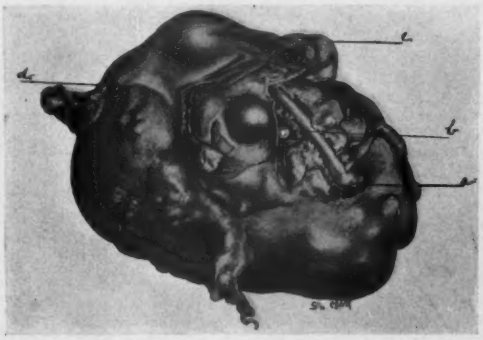


Fig. 1. Drawing of specimen after removal from pelvic cavity. *a*. Femur. *b*. Tooth. *c*. Tube and ovary. *d*. Orbital plate of frontal bone.

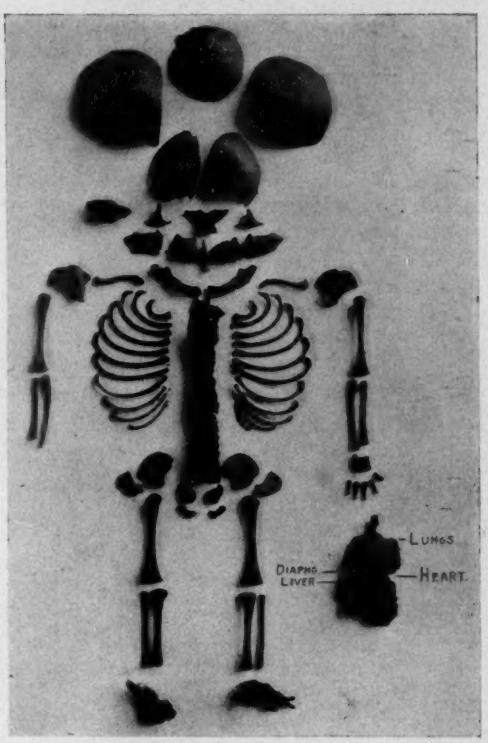


Fig. 2. Photograph of skeleton dissected and arrange from the original specimen, as shown in Fig. 1. Picture is reduced to one fifth of size.

Cheston, according to Bland-Sutton, reported the history of a patient who, in 1738, was taken in labor with her fourth child. Instrumental delivery was advised, but to this the mother positively objected. The child did not come away, and the patient survived the incident 52 years, and died in 1790 at the age of 80 years. After death a lithopædion was removed.

Barnes reports the history of a woman who retained a similar mass in her abdominal cavity for a period of 43 years.

The vertebral column measured six inches in length. All the bones were well formed, as is shown in the following illustration. (Fig. 2.) The muscles of the fœtus were also well developed, but were hard, shriveled, and dry. The abdominal organs had undergone a similar change, and could not be separated or recog-

nized, with the exception of the liver, a small portion of which is seen in the drawing, and the heart and lungs are fairly well preserved. These, also, are shown in the above illustration.

The specimen is interesting, first, from its comparative rarity, and second, from the long period in which it existed in the abdomen without undergoing some infectious or degenerative process. It is interesting, furthermore, from the fact that the three pregnancies and labors occurred while the patient was carrying the tumor. There was absolutely no sign of any necrotic change in any portion of the mass.

This unusual case occurred in the service of Dr. E. E. Montgomery in St. Joseph's Hospital, and I am indebted to him for the privilege of reporting the history.

DEPARTMENT OF TECHNIQUE

JEFFERSON MEDICAL COLLEGE

Department of Obstetrics

TECHNIQUE OF CLOSING LACERATIONS IN THE ANTERIOR AND POSTERIOR SEGMENTS OF THE PELVIC FLOOR AND PERINEUM IMMEDIATELY AFTER LABOR

By G. A. ULRICH, M. D., PHILADELPHIA

Assistant Demonstrator Obstetrics, Jefferson Medical College; Clinical Instructor Out-patient Obstetrics, Jefferson Medical College

It will be necessary to call attention to the technique of the third stage of labor, bearing in mind that immediately after the delivery of the child the uterus is grasped through the abdominal wall, and held so that it shall not relax, and that this must be continued throughout the remainder of the treatment of labor, and as long after the labor as it shall seem necessary.

During the second stage of labor the patient is placed on the left side, with her buttocks at the edge of the bed. As soon as the child is born, the position of the patient is changed so as to facilitate the ease with which the third stage is conducted, and right here I wish to lay stress on the proper position for the third stage. The habit of simply turning the patient on her back in the middle of the bed cannot be too strongly condemned; for it will be readily seen that while the afterbirth may be delivered in this posture, it is absolutely impossible to examine thoroughly for lacerations, and if any be found, it is impossible to repair them. Therefore it is better to place the patient in such a position for the delivery of the placenta that she may be thoroughly examined for lacerations, and the repair made in the best possible manner.

To accomplish this, the patient is turned across the bed, with the buttocks projecting slightly over the edge; the feet may be supported on two chairs, held by assistants or nurses, or a sling made of a sheet passed under the shoulders, the ends tied around the legs below the knees; the legs and thighs are flexed, the latter being rotated outward as much as possible, to give ample room for work.

In the indoor service a pair of sterile leggings, with a sheet attached, are placed on the patient, the sheet covering the lower part of the abdomen, a sterile towel being placed beneath the buttocks, thus surrounding the patient with fresh sterile linen. In the out-patient service, when sterile leggings are not available, the same result is obtained by taking four towels or napkins and soaking them in a strong, warm solution of bichloride, wringing them as dry as possible, and placing one across the abdomen and pubes, one around each leg, and the other under the buttocks.

Ample time is given for the separation and descent of the placenta, and as it is of the greatest importance for the patient's welfare that the sutures be properly placed, it is preferable to wait until the placenta is delivered before making any effort to locate the site and extent of lacerations and placing the sutures; for as long as the placenta is still within the uterus there will be a steady stream of blood flowing over the parts, which prevents the operator from defining accurately the position and extent of the tear. After the placenta is delivered, all blood-clots are removed by means of a vaginal douche, and the parts sponged perfectly dry. It is immaterial which segment is the first to be repaired, but, in my opinion, the anterior is more accessible, if taken before the posterior; besides, there is then no interference with the sutures placed in the posterior wall, and the bleeding from the anterior lacerations, which is often considerable, will not flow down and impede the operation on the posterior segment.

When ready to begin work, separate the vulvæ widely, and make the diagnosis of lacerations of the anterior segment by inspection. The tears will usually occur on one side or on both sides of the vagina, or there may be a laceration in the middle of the anterior wall. This last laceration generally lies very near the urethra.

The repair is made with chromicized catgut sutures, placed so that the tissues torn shall be brought in perfect apposition, using as many sutures as necessary. There are two precautions that must be observed. First, in those tears situ-

ated near the urethra it is obvious that care must be taken not to close this organ; this may be prevented by placing a catheter in the urethra before suturing, using it as a guide, or closing the tear and subsequently passing the catheter to see that the structure is patulous. The second precaution deals with the anatomy of the part. It is well known that there is a bountiful supply of blood-vessels lying around the urethra in the anterior segment of the pelvic floor, and when laceration occurs the bleeding from these vessels will be profuse. It is therefore necessary, when repairing this part of the vagina, to pass the sutures deeply around a large amount of tissue, so as to prevent further hemorrhage. The sutures are cut close, and need no further attention if the external dressings are kept sterile, as they should be after all labors.

For the posterior lacerations the same preparation and position are required as for the tears in the anterior wall. These lacerations are usually described as complete and incomplete, or lacerations of three degrees, lacerations of the first degree involving the mucous membrane, the fourchette, and possibly the upper layer of fascia with a little muscle, lacerations of the second degree extending down to but not involving the coat of the bowel, lacerations of the third degree tearing into the bowel and making one canal of the lower part of the rectum and vagina. The latter classification is preferable, for the pelvic floor is never completely torn, as the former indicates.

In making these repairs, a complete and comprehensive knowledge of the anatomy of the pelvic floor is required. The operator must know definitely the muscles, fascia, and different parts of the perineal body, with their relations.

Many writers place most stress on the muscles, but I agree with those who call attention to the fascia as the chief support of the pelvic organs. Taking the latter to be true, it is obvious that more attention must be given to bringing fascia to fascia, where it has been severed, rather than placing stress on bringing muscle to muscle.

The only instruments required are a pair of needle-forceps and two or three full-curved needles of different sizes. The Hagedorn needle has, in my experience, proven the best variety. Plenty of cotton sponges are necessary to keep the field dry during the suturing. The suture material used is catgut for the mucous membrane and silkworm-gut for the skin tear.

The diagnosis and extent of the tear is of the first importance, and to make this, the patient being in the posture above described, inspection alone is inadequate, for very frequently there may be quite an extensive laceration of the pelvic floor without involving the perineum, and as the pelvic floor is the true support of the internal organs, serious results may follow a case where there has been no laceration visible on inspection; therefore, to examine thoroughly for tears of these parts, it is absolutely imperative that the pelvic floor be exposed. This is done by placing the middle finger of the left hand in the rectum as far as possible, separating the vulvæ with the index and ring fingers, after which the middle finger is flexed, throwing the entire posterior vaginal wall into view; the blood is then sponged from the parts, and inspection will reveal any tears that may be present.

The tear will be seen to consist of two parts; the one involving the internal structures with the covering mucous membrane, the other the external or skin part. Each must be sutured as if separate lacerations, perfectly sterile chromicized catgut being used for the former and silkworm-gut for the latter.

In sewing the internal laceration, begin at the upper point of the tear and sew towards the vaginal outlet, using interrupted sutures and passing them so that the point of entrance and the point of exit of the needle shall be on the same level, or in other words, equally distant from the vaginal outlet. The needle must be passed entirely around the tear, i. e., it must not appear in the wound. This line of sutures must not be carried farther than the mucous membrane and skin junction. The caruncles may be taken as the lower limit. It is important that these sutures are not carried too far, as the result will be poor support and a gaping vulvar outlet. The other line of sutures starts at the point of the skin laceration nearest the anus, and is carried upward until meeting the former sutures. These are of silkworm-gut, and are also passed around the tear. Plenty of tissue must be taken in on both sides to secure perfect apposition and to avoid the formation of a dead space that will fill with blood and serum, thus forming a suitable culture media for bacteria; besides, the larger the amount of tissue grasped by the sutures, the easier it will be to bring the tissues together, and consequently the likelihood of cutting is proportionately diminished.

These sutures are all placed in position before any are tied. They are tied beginning at the one nearest the rectum and going upward. The ends are not cut short, but left long and tied together in a knot. This prevents the ends from irritating the surrounding skin and facilitates removal.

Deep lacerations, or those extending to the bowel, involve the sphincter of the rectum. The first and most important aim is to unite this muscle properly.

The torn ends must be definitely located by sight and each end caught with a catgut suture, which, when tied, will bring the ends of the muscle into position, when a second suture is passed through the fascia covering the muscle, making the union complete. These sutures are buried by closing the remainder of the laceration as if it had been a simple tear. If the tissue between the vagina and rectum is very thick, a layer of buried sutures may be placed in the deeper structures, being careful to bring the levator ani muscle and its fascia well together. There is one other point to be borne in mind; namely, the catgut placed in the sphincter is not sufficiently strong or durable to hold it until union takes place; therefore the first silkworm-gut suture must be passed in such a manner that it will also include the torn ends of the sphincter and reinforce the catgut sutures already placed.

In the laceration that involves the wall of the rectum the first step is to close the bowel-wall.

This may be done in one of two ways. Pass the suture from the rectal side and allow it to become infected, taking care that it does not pass deeply into the tissues. The other and more satisfactory method is to pass the suture from the vaginal side, partly, but not entirely, through the mucous membrane, bringing it together without any part of the suture getting into the bowel. A continuous suture is used, beginning at the upper part of the tear. After this is closed, the remainder of the laceration is repaired as in the deep laceration.

The after-care of the stitches is very simple. The dressings are changed as in normal cases. Whenever they are removed, the vulvæ are separated with the fingers of a sterile hand, and a solution of lysol one per cent, saturated solution of boric acid, or normal salt solution, is poured over the sutures from a pitcher. Douches are not indicated. The silkworm-gut sutures are removed in eight or ten days, when union should be complete. Should the sutures cut or become infected, those involved must be removed at an earlier date. In the complete lacerations it is a mistake to lock the bowels with opium, but on the second day after labor a purgative, preferably a few compound cathartic pills, should be given, and when the patient feels an inclination to move the bowels, an enema of eight ounces of warm olive-oil should be given. This allows the bowels to move without straining, and keeps the fæcal matter from coming in contact with the wound. After the bowels are emptied, they should be washed out with normal salt solution.

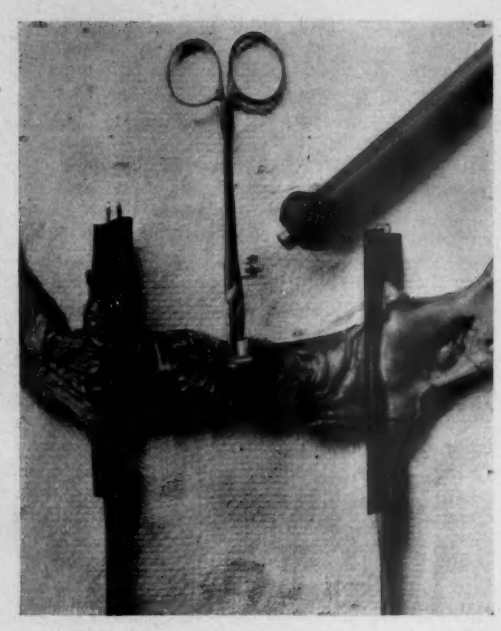
JEFFERSON MEDICAL COLLEGE

Department of Surgery

NOTE ON THE TECHNIQUE OF IMMEDIATE ENTEROSTOMY

By FRANCIS T. STEWART, M. D., Philadelphia

Acute intestinal obstruction and intestinal paralysis are the only conditions in which an immediate opening of the intestine for drainage may be mandatory. In the former, the indications are, first to save life and later to cure the patient; in other words, to drain the intestine and then remove the obstruction. The latter permits the former, and is indicated in early cases in which peristalsis is active and the general condition good. At a later period, the patient is in no condition for a radical operation, and indeed, even when such is permissible, the intestinal movements are often so feeble that removal of the obstruction alone is insufficient to afford relief. In these cases enterostomy has its greatest value, as the danger is not so much the obstruction as the results of the obstruction, i. e., distention of the intestine, and the absorption therefrom of toxic products, which, as in like conditions elsewhere, e. g., in the appendix and gall-bladder, are generated with great rapidity. In many instances in which the obstruction is not sought, there may be a risk of peritonitis from sloughing or perforation of the bowel at the site of obstruction, but such risk is less than that of a prolonged search or of any procedure other than the simplest and quickest. In the last stages in which peristalsis is absent, or in complete intestinal paralysis from other causes (adynamic ileus), the intestines are as motionless as an anatomical specimen, and refuse to accept the opportunity for disengorgement offered by an enterostomy. The author has never seen a recovery under these circumstances, although he has tried catheterization of the intestine and milking the bowel, and



Showing application of button.

hence has reached the conclusion that adynamic ileus, if such diagnosis can be definitely made, is perhaps best managed by the physician.

In the second group of cases mentioned above, immediate enterostomy, either as the sole operation or as supplemental to removal of the obstruction, involves a considerable risk of infection of the peritoneal cavity from fæcal contamination. Carefully isolating the loop of bowel to be opened by gauze packing may avert this danger, but the proceeding is hazardous. The same may be said of close sutures uniting the bowel to the whole circumference of the abdominal wound. Furthermore, the intestinal wall is generally so stretched and thinned as the result of the distention that it is often impossible to secure a firm hold with the needle without entering the lumen and causing leakage. Up to the present time, the safest plan for draining the intestine in these cases has been by means of Paul's tube or one of its modifications. At the May, 1905, meeting of the Philadelphia Academy of Surgery, the author suggested the following method: After opening the abdomen, the desired loop of bowel is drawn into the wound and emptied of its contents by a gentle milking process. A clamp, the blades of which are covered with rubber tubing, is then placed at either extremity of the loop to prevent fæcal reflux, and the whole is surrounded by gauze packing. One half of a Murphy button is inserted into the empty loop of intestine through a small incision, and the other half is squeezed into the end of a long rubber tube whose caliber is slightly smaller than the flange of the button, over which it projects like a phymosed foreskin, thus making a tight joint. The two halves of the button are then pressed together, or in other words, a lateral implantation is made between the rubber tube and the bowel. The clamps are now removed and the fæces allowed to drain through the rubber tube into a receptacle on the floor. Whether or not a bar has previously been placed beneath the bowel, the intestine should now be securely fastened to the margins of the wound by sutures, in order to prevent the prolapse of any additional coils of intestine; with a collapsed bowel the sutures may be introduced without fear of leakage. By this method an absolutely air-tight joint is made between the bowel and the rubber tube, so that the intestine is drained without the slightest possibility of soiling the peritoneal cavity. By the time the button has sloughed through the bowel (usually three days), adhesions will have effectually closed the peritoneal cavity, and there will be no longer any danger of infection. The dressing need not be disturbed until the button becomes loose.

The method has been employed in seven cases, three of which survived. It is interesting to note that in each instance in which the patient did not promptly succumb, the necrosis induced by the button extended for some distance beyond the tissues subjected to pressure, in one case as far as half an inch.

JEFFERSON MEDICAL COLLEGE

Department of Obstetrics

TECHNIQUE OF DELIVERY BY ABDOMINAL SECTION [1]

By EDWARD P. DAVIS, M. D., PHILADELPHIA
Professor of Obstetrics in Jefferson Medical College, etc.

Preparation of Patient. As thorough as time will permit; purgatives, if possible; high enemata; shaving, scrubbing, and antisepticizing the abdomen and external genital region. A sterile dressing to be placed over the abdomen until the moment of operation. One arm prepared for intravenous saline transfusion. Antisepticizing the skin and covering the area with a sterile dressing. If uterine contractions are so violent as to threaten uterine rupture, one eighth to one sixth grain of morphia may be given hypodermatically; should the patient be exhausted, one thirtieth grain of strychnia may be given.

Instruments. Instruments for hysterectomy, vaginal and abdominal. The writer uses Polk's vaginal hysterectomy clamps when hysterectomy is performed. Full curved Hagedorn needles threaded with medium-sized best quality silk; several small needles threaded with fine silk or No. 1 catgut; needles for closing the abdomen threaded with silkworm gut. These to be threaded before the operation. At least eight needles should be ready with silk sutures. These instruments are divided into two parts and kept in closed copper nickel-plated pans. They are kept ready for operation at all times. When needed, they are boiled in water in the pans, whose covers are not removed until the operation.

Posture of Patient. Pelvis slightly elevated, patient prepared for Trendelenburg posture if necessary; as marked variations in breathing may occur, the operator must be prepared to vary the patient's position.

Assistants. First assistant, accustomed to abdominal surgery, controls hemorrhage by encircling the lower portion of the uterus with his hands; this assistant, if possible, should be the same at each operation. Anæsthetizer, experienced in abdominal surgery, using ether, or chloroform and oxygen, or ether and oxygen; should also be prepared to transfuse if necessary; should have in readiness two hypodermatic syringes, working well, one containing 1-30 grain of strychnia and 1-150 grain of atropin in solution, the other filled with any reliable

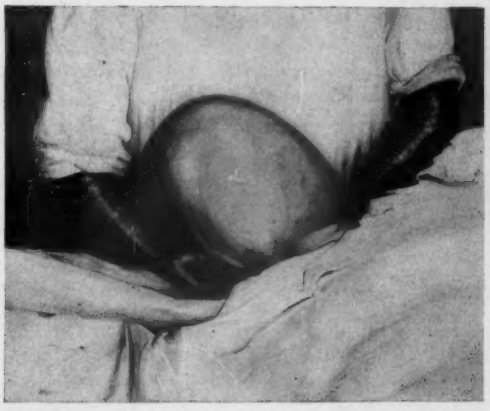


Fig. 1. The uterus unopened, and turned out of the abdomen.

Fig. 2. Incision through the uterine wall; control of hemorrhage by grasping broad ligaments.

[1] In the illustrations in this article the operator is represented wearing gloves; to distinguish him, the assistants do not. The photographs were taken during operation and redrawn.

Fig. 3. The child delivered.

Fig. 4. Uterine wound closed; uterus not fully contracted.

preparation of ergot, prepared for hypodermatic use. Assistant to receive the child; experienced obstetric nurse can take this place if necessary; this assistant should have two pairs of hæmostats or clamps for umbilical cord, ligature for cord, scissors, hot and cold water, child's bathtub, if needed for resuscitation. Assistant in control of instruments should limit her work to keeping needles threaded. The operator should accustom himself to take up and put down his instruments without meddling from any one else. A reliable nurse should be in charge of pads, salt solution, iodoform, and sterile gauze and sterile dressings.

Aseptic Precautions. Operator and assistants should take all possible precautions to guard against septic infection; sterile suits, rubber gloves, and head-coverings should all be used. When operating in small rooms, care must be taken that spectators do not crowd around the table. The patient is to be covered with sterile linen, and when anæsthetized is to be catheterized under antiseptic precautions, and the preparation of the abdomen repeated; this consists in scrubbing with green soap and hot sterile water, rinsing with hot sterile water, scrubbing with alcohol and rinsing, scrubbing with bichloride, and again rinsing with sterile water. Especial attention is paid to the umbilicus.

The Prevention of Hemorrhage. The writer has never employed a rubber ligature or constricting band in performing the operation. In operating alone, its use might be admissible for a few moments only. Hemorrhage is controlled by the hands of the first assistant, who compresses the broad ligament or encircles the uterus, as conditions in the case indicate.

Operation. When the patient is thoroughly anæsthetized and breathing regularly, the abdomen is opened in the median line, and as soon as it is opened, the finger is introduced to determine the presence or absence of adhesions or of any organ between the abdominal wall and the uterus. In cases of highly contracted pelvis the bladder may be spread out upon the anterior wall of the uterus, reaching nearly to the umbilicus. The abdominal incision should be made near the umbilicus to avoid wounding the bladder. This knife should then be laid aside and the abdominal incision enlarged sufficiently to eventrate the uterus. At this time considerable dyspnœa may occur from the pressure of the uterine tumor during efforts made to dislodge it. As soon as the uterus is turned out from the abdominal cavity, a large, soft, sterile towel should be wrung out of hot sterile salt solution and packed behind the uterus, the intestines having been replaced in the abdomen if they have prolapsed; time should be taken to adjust this carefully. The first assistant then clasps the uterus or broad ligaments; the assistant who is to receive the child stands at the left of the operator, and taking a second scalpel to avoid uterine infection from the first, the operator opens the womb; a point on the anterior surface well above the lower uterine segment is selected, the incision extending nearly to the fundus. The operator must remember that the incision must be large enough to permit the egress of the child without tearing the uterine muscle, and should also not be unnecessarily large. If the placenta is under the line of incision, this does not alter the procedure in the least. The knife is carried through the tissues by repeated strokes until the fingers pass into the cavity of the womb; the incision may then be enlarged by probe-pointed, bandage-scissors to the requisite size, and the membranes ruptured if necessary, the placenta torn

through if necessary, and the child grasped by one of its limbs, and gently and carefully extracted with its head downward; it is immediately given to the assistant, who clamps the cord in two places, cuts the cord, and removes the child. The placenta and membranes are then completely separated and removed, and hot sterile salt solution is poured into the uterine wound, escaping through the cervix. Strychnia, atropin, and ergot, in readiness, are then given by hypodermatic injection. The uterine muscle, avoiding, if possible, the decidua, is closed by silk sutures tied firmly. The first assistant stimulates the uterus to contraction by surrounding it with hot towels or by gentle massage. Should relaxation and bleeding threaten, the uterus may be tamponed with iodoform-gauze. If the operator proceeds rapidly to suture the uterus, and so places his sutures as to include the largest uterine sinuses, bleeding will be inconsiderable, and the uterus will promptly contract. A continuous suture of moderate sized catgut or fine silk then closes the uterine peritoneum, with the upper layer of the uterine muscle, completely covering the silk stitches in the muscle; the uterus is then replaced, intestines and omentum brought as nearly as possible in normal position, a pint of salt solution introduced into the abdomen, and the abdominal wall closed, with accurate approximation of tissue.

If the umbilicus is weak and the tissues greatly distended, this occasion may be utilized to remove the umbilicus, as the patient usually obtains a better scar. If necessary, the stimulation given hypodermatically is repeated, and in desperate cases, transfusion is practised.

Application of the Dressing. Sterile gauze is placed over the line of incision, and a good-sized pad of sterile gauze is placed above the uterus, transversely across the abdomen, a prepared abdominal dressing is placed over all this, held in position by strips of adhesive plaster three inches wide, extending two thirds of the way around the patient's body and overlapping. This dressing is applied firmly from above downward, and is believed to be a most important adjunct in securing a good convalescence; over this is placed the usual many-tailed bandage. During the application of the dressing the thighs of the patient should be moderately flexed.

Disinfection of the Vagina. Before the operation the vagina should be thoroughly cleansed with tincture of green soap and lysol, one per cent; after the operation, the operator should thoroughly sponge out the vagina with sterile cotton dipped in bichloride solution, 1 to 2000. Clotted blood is usually found, and this should be thoroughly removed.

The Care of the Child. No difficulty has been found in bringing any of the children, in good condition at operation, to breathe; holding the head down, folding and unfolding the body, cleansing the mouth, have been sufficient; if necessary, other methods for resuscitation should be practised.

Celiohysterectomy. The majority of cases are celiohysterotomies, as already described. In celiohysterectomy the usual method of clamping the broad ligaments, ligating the vessels, amputating the uterus through the lower uterine segment, and covering the stump with peritoneum is employed. Care should be taken in ligating the round ligament,

Fig. 5. Uterus closed and contracted. Patient receives oxygen by tube, through ether-inhaler.

Fig. 6. The uterus returned to the abdominal cavity. Salt solution poured into the abdomen.

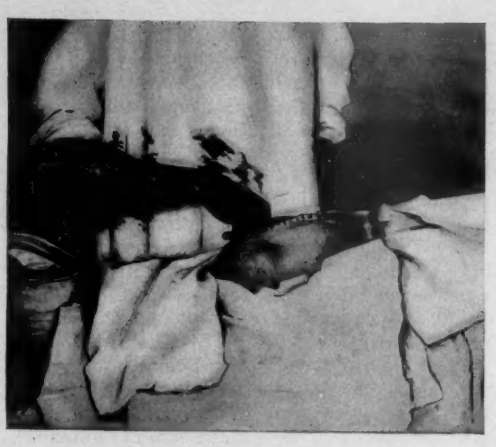


Fig. 7. The abdominal wound closed.

as its nutrient artery is large enough in pregnancy to occasion hemorrhage. If the needle be directed invariably toward the cervix, there should not be danger of wounding the ureter. The veins of the broad ligaments, if greatly distended, should be carefully avoided.

The Porro Operation. In performance of this operation the uterus and contents are drawn strongly upward from the abdominal cavity; after emptying the uterus, two broad clamps are placed across the lower uterine segment, overlapping, and at right angles with the long axis of the mother's body; ovarian arteries are tied and the broad ligament severed; if there is time, the uterine arteries may be tied. The uterus is amputated through the lower segment above the clamp, and the peritoneum is closed and sewn around the stump; time should be taken to do this carefully. The abdominal wound is closed as rapidly as possible; the clamps and stump are wrapped in gauze, the stump having been freely powdered by iodoform. Polk's long vaginal hysterectomy clamps have been used with satisfaction in these cases.

Fig. 8. Application of the abdominal dressing.

Time of Operation. The time for celiohysterotomy varied from forty-five to sixty-five minutes; the Porro operation can be done in thirty-five minutes; celiohysterectomy requires from sixty to eighty minutes. These times are for the complete performance of the operation, including the application of the final dressing.

JEFFERSON MEDICAL COLLEGE
Department of Surgery

THE OPERATIVE TREATMENT OF CARCINOMA OF THE RECTUM[1]

By J. COLES BRICK, M. D., PHILADELPHIA
Chief Clinical Assistant, Rectal Department, Jefferson Medical College Hospital

Before proceeding to a discussion of the various operative methods in the treatment of rectal cancer, the work of Professor Jensen of Copenhagen in the pathology and therapeutics of cancer as a disease merits attention. In awarding the Walker prize, the Council of the Royal College of Surgeons quoted the description of his work from a letter of Professor Salomonsen of the State Serum Institute of Copenhagen, as follows: "The inoculation of cancer from animal to animal had been made in comparatively few cases, and therefore afforded no decisive material for the study of cancer. Professor Jensen first succeeded in discovering a tumor in the mouse, which made the experimental investigation of cancer on a large scale possible. He first carried out a large series of inoculations through thirty-five generations, comprehending about one thousand mice, and thus gave the impulse to certain experimental investigations which are now being carried out in different parts of the world. He thus made it possible to investigate, and was the first to investigate systematically, the effect of different factors (heat, light, chemical agents, radium, etc.) on the cancer-cells. He further demonstrated the possibility of producing an anticancer serum for mice, by the injection of the crushed tumor into rabbits. The serum of rabbits, thus prepared, has been injected into mice suffering from cancer, with the result that the cancer tumors in many of them disappeared permanently."

From the above statement of the present status of experimental research into the ætiology of cancer, it is readily seen that the cause of the disease is still awaiting discovery, and that no advance has been made in the treatment, over early and radical removal of affected tissue. The method of cataphoric diffusion of nascent mercury and zinc salts we note only to condemn, for, while it may be possible to produce necrosis in the tumor-mass by the formation of albuminates of mercury and zinc, it is impossible to reach metastases in outlying lymph-glands, so that, lulled by a false sense of safety, time passes, during which radical cure is possible, until the moment comes when it is hopeless.

The consensus of opinion among surgeons at the present time is that all anatomically related glands, fat, and tissue should be removed as radically in every way as for mammary or labial cancer. A study of the lymphatic circulation of the rectum by Gerota (1, *a*) shows that the lymphatics of the anal skin drain outward, toward the thigh and inguinal glands, and upward, uniting with the columnar group to follow the course of the superior hemorrhoidal artery branches, and finally, with the other lymphatics of the rectum, drain into the glands occupying the sacral hollow, as high as the promontory, and then are inclosed by the peritoneal leaves, forming the mesosigmoid. The glands and vessels which are lateral at first converge, and finally all drain into a chain of glands in the middle line posteriorly, above the levator ani muscle, which accompanies the superior hemorrhoidal artery to a point above the promontory of the sacrum. The anal margin has an anastomotic circulation of lymph-vessels with the rectal lymphatics, so that in cases of cancer low down the sacral glands are sure to become involved. Owing to this early involvement of the lymphatics, great improvement is still possible in the early diagnosis of the disease, as an average period of nine months elapsed from the first appearance of the symptoms to the time the diagnosis was made, in Hartwell's (1, *b*) series of 46 cases, as reported in the *Annals of Surgery*. A careful digital and instrumental examination of every case presenting symptoms of tenesmus, burning pain in the lower bowel, sacral pain, or rectal bleeding, should be made, as it is only by this means that cases will come to operation at a period early enough to give the best hope of absolute cure. Too much stress cannot be laid on this point, and in doubtful cases the law laid down by Mayo, that "pyloric cancer, to be treated successfully, must be removed, even if it require an exploratory laparotomy to establish the diagnosis" (1, *c*), would apply equally well to malignant disease of the bowel. Andrews (2) has formulated a law of accelerating risk in cancer: 1. The risk of recurrence (or rate) in malignant growths increases as the square of the time of growth; or, conversely, 2. The

[1] Read before the American Proctologic Society, Boston, Massachusetts, June 5, 1906.

risk of recurrence diminishes in the ratio of the square root of the time after incidence. Thus, doubling the time increases the risk of recurrence, not twice, but fourfold; quadrupling the time increases it sixteen fold.

Rectal cancer has been divided (3, *a*) into two clinical groups: those within easy reach of the finger, not exceeding 2 to 2½ inches from the anus; and 2. Those lying above the levator ani muscle, which can be reached digitally with more or less difficulty.

As brilliant an operator as Mayo (3, *b*) says: "The mortality is from five to ten per cent, and permanent cures are to be expected only after early operations. We have a few satisfactory results, but the majority had speedy return."

The operation most generally used for cancer low down in the rectum is the perineal, with or without the long cut backward toward the coccyx, and in the female, the anterior or vaginal method. For high rectal cancer, or that beyond *easy* reach of the finger, many operators favor the lower or sacral route, which has its advantages, but an increasing number are using the combined abdominoperineal method devised by Quenu in 1897, and this method, as modified by Mayo, will be given here, as being as near the ideal operation as any yet devised. "The patient is placed in the high Trendelenburg position, and the abdomen freely opened in the middle line. The upper limits of the growth and its relation to the surrounding tissues are noted. The possibility of removal of all of the obviously infected glands is ascertained, and the liver examined for embolic carcinoma. If the case is a favorable one, the intestines, with the exception of the sigmoid, are carefully packed away with large gauze pads, two clamps are caught across the lower sigmoid, on a level with the promontory of the sacrum, and the bowel divided between. The mesosigmoid is liberated by lateral incisions and the proximal fragment brought up outside of the abdominal wound. A ligature is thrown around the bowel immediately below the forceps, which are removed as the ligature is drawn tight. A purse-string suture is placed an inch below the end of the stump, which is invaginated in a similar manner to an appendectomy. The ends of the ligatures are left long. The threads and stump are carefully cleansed. A small gridiron incision is now made on the left side, as would be done on the opposite side for appendicitis, and through this opening, using the ends of the threads as a tractor, the proximal stump is pulled out three fourths of an inch beyond the skin surface. Three or four linen sutures are quickly placed, uniting the bowel on the inner side, and a silkworm-gut suture on the outside closes each angle of the wound, including in its bite the skin, aponeurosis of the external oblique, and the wall of the bowel, holding it securely in position. The distal stump is treated by inversion in a similar manner, preventing soiling. Lateral and anterior peritoneal incisions are now made, liberating the rectum from the bladder and prostate in the male, and the uterus in the female. The inferior mesenteric artery, which is the upper continuation of the superior rectal, is caught and tied above and to the left of the promontory of the sacrum, at as high a point as can safely be done without interfering with the nutrition of the bowel used in the colostomy. The fat is carefully separated. The entire mass of gland-bearing fascia, with the fat, is wiped perfectly clean to the periosteum. The middle sacral artery is of considerable size in most cases, and should be caught and ligated near its origin from the abdominal aorta, between the common iliac vessels. The dissection is continued downward, exposing the internal iliac vessels and the ureters. Most of this can be done by sponging. The middle hemorrhoidal vessels are caught laterally as they come off with the inferior vesicles. The entire area is now packed with hot moist gauze, and the patient put in the perineal position. The operator, or preferably a second operator, after inserting gauze in the rectum to facilitate subsequent dissection, and closing the anus by a circular suture, circumscribes the anal margin with a deep incision, and dissects the perineal portion of the rectum, with its muscles and fat, free from the prostate and urethra, or in women the vagina. This extends up to just above the levator ani muscle, which forms the boundary line between the upper and lower dissections. The abdominal operator now passes down the fragment of lower sigmoid, and the upper end of the rectum, with its fat and glands, into the perineal opening, where they are removed by the surgeon working below, or one operator with changes of gloves can accomplish the work in both fields. All bleeding-points are caught and ligated. A considerable sized gauze drain is passed from above downward, leaving its upper end just exposed, on a level with the peritoneum, which is drawn together to cover as much as possible, the external portion being brought out of the perineal wound. The sigmoid trap from above is pulled down over the exposed surface, and in the female the body of the uterus, and the broad ligaments are adjusted with a few sutures to aid in covering. The upper incision is completely closed, while the perineal opening is narrowed to proper dimensions for drainage by a few sutures. The end of the sigmoid is left completely obstructed for the first twenty-four hours, after which time the circular suture is cut,

and the stump everted by the ligature, which is tied around it, and the bowel opened. In a few cases we have modified this operation, when the cancer lay very high, by leaving the perineal portion of the rectum, and passing the gauze drain through it, or in one case draining through the vagina after closing the rectal pouch. If acute obstruction exists, a colostomy should be made as low down as possible, in order to save the sigmoid fæcal container, as a primary operation, and two weeks later the radical procedure, as above outlined, completed, excepting that the colostomy is maintained as a permanent opening, the bowel being divided and closed near the abdominal attachment."

In the operation advocated by Hartwell (4), following an intermuscular inguinal colostomy just external to the left rectus, he makes an incision in the linea alba at the same level as the intermuscular incision, or slightly above it, and the anterior sheath of the rectus between the two incisions is raised up from the muscle. The proximal end of the gut with the mesentery is then drawn under this strong sheath, over the rectus, and fastened into the skin and fascia wound, in the middle line. The gut is tacked to the peritoneum, where it emerges from the peritoneal cavity, and the skin and fascia wound is here closed. A small catheter is inserted into the proximal gut for gas. Three weeks later, the radical amputation is done, by placing the patient in the exaggerated knee-chest position for control of venous oozing, and an incision made from the third sacral vertebra downward to and around the anus. The anus is then tied with a purse-string suture, and the coccyx and one or two sacral vertebræ are resected, and the presacral tissues as high up as the second vertebra are pushed away from the bone, saving only the sacral nerves, including all lymphatic glands and vessels which may be infected. The superior hemorrhoidal artery is ligated next, and the gut freed posteriorly and laterally, and the peritoneum opened. The rectum is drawn down to the blind end, or if fastened in the colostomy wound, well up toward it. If unfastened, the whole lower segment will be removed; if fixed, the gut is divided between two purse-string sutures with the cautery, and the upper end closed. The gut is freed, and removed with the glands and lymphatics.

In comparing the two methods, it seems as if the Quenu-Mayo has the advantage of having a better visual operative field for the important ligations and dissections, while the use of the cautery in severing the fixed distal gut through the sacral wound is difficult. Both, however, aim at a radical and complete removal of all lymphatic tracts as well as the sphincters.

It has been my fortune to take part in operations on four cases of cancer of the rectum since our meeting last year, one of which was a Kraske for a growth above the levator ani muscle, which resulted fatally from acute gastric dilatation. The other three were for growths low down. The perineal method was used. They are now in satisfactory condition, but of too recent date to warrant any conclusions. While not being able to add anything to the operative technique, and hesitating to call attention to facts which are familiar to you all, I shall be glad if this paper calls forth a discussion in which the subject of rectal cancer and its operative treatment is given the attention it deserves.

In conclusion, the anastomotic circulation of the lymphatics at the anal margin with the sacral glands shows that the latter must become involved, thus rendering the preservation of the sphincters impossible in all cases where the growth is low down. Where the cancer is situated high up in the rectum or lower sigmoid, the same condition prevails, which renders it necessary, in order to remove all diseased tissue and to effect a radical cure, that *all* cases of cancer of the rectum and sigmoid shall have entire removal of the lower bowel from a point well above the growth, as well as the glands, fat, and tissue in the hollow of the sacrum cleared out to the periosteum. The sphincters should be sacrificed, also, as a source of danger, and the bowel function maintained through a permanent inguinal anus. While this would require a major operation for every case of rectal cancer, yet the percentage of returns of the disease under present methods indicates a more thorough treatment than has yet been given, and yet one no more radical than is done for cancer of the lip or of the breast. Finally, the proper procedure to decrease the mortality is the education of the general practitioner as to the necessity and as to the method of an early digital and instrumental rectal examination for symptoms referred to this viscus, so that cases may reach operation at an early period of the disease.

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CASE REPORT

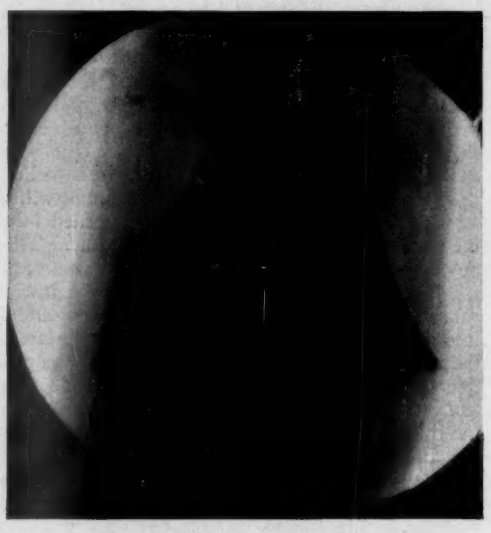
FURTHER OBSERVATIONS ON EXTENSIVE SEPARATION OF THE PERIOSTEUM IN DISPLACED BONE FRAGMENTS

By CARL BECK, M. D.

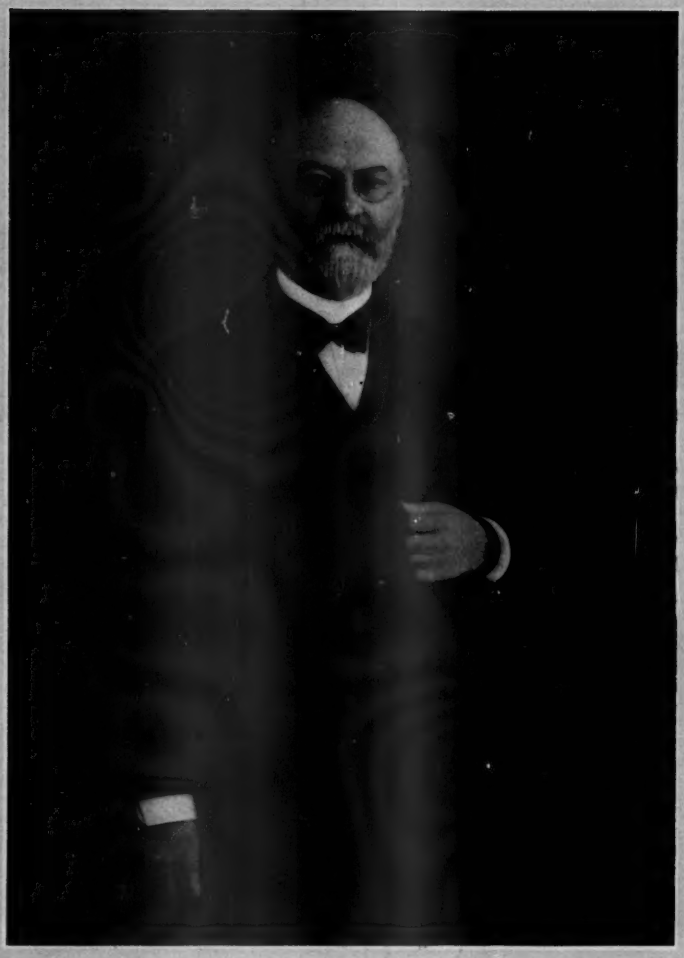
Professor of Surgery in the New York Post-Graduate Medical School and Hospital; Visiting Surgeon to the St. Mark's Hospital and the German Poliklinik

In the March issue of SURGERY, GYNECOLOGY AND OBSTETRICS I had the privilege of calling attention to a phenomenon not known before the Röntgen era; viz., a peculiar mode of separation of the periosteum. Since then I had an opportunity to observe this condition in a most extensive degree.

The patient, a girl of six years, fell from a hammock on May 20th, and fractured the lower end of her left radius. The family physician was called at once and tried to reduce the fragments, which were considerably displaced, under general anæsthesia. After repeated efforts, which were in vain, the patient was referred to my clinic two weeks after the accident. I found well-marked lateral displacement, a sharp piece of bone projecting below the skin above the internal condyle. The Röntgen examination revealed enormous sideward displacement. At the same time, it was found that the periosteum had remained unimpaired, as far as the lower fragment was concerned, while it was completely stripped off from the lower third of the upper. (See illustration.) By a chisel operation performed at the Post-Graduate Hospital on the following day, the fragment was completely reduced. A second picture, taken after the operation, through the plaster-of-Paris dressing, shows the fragments in place. To-day, four weeks after the operation, the result is perfect.



Showing extensive periosteal separation.



ACHILLES ROSE, M. D.

DEPARTMENT

NICHOLAS SENN FESTSCHRIFT

PHYSIOLOGY AND PATHOLOGY OF THE ABDOMINAL MUSCLES

By ACHILLES ROSE, M.D., New York City

IN text-books on anatomy we read that the action of the abdominal muscles consists in compressing the abdominal viscera, thus constricting the cavity of the abdomen, and that by this means the fœtus is expelled from the uterus, the fæces from the rectum, the urine from the bladder, the ingesta from the stomach in vomiting. These, however, are only occasional actions of these muscles; they have most important tasks to perform, of which nothing is said in text-books. First of all, they have to preserve the physiological position of the abdominal viscera. The acute crosswise fibrous arrangement of the three flat muscles of the abdominal wall — the obliquus abdominis externus, obliquus abdominis internus, and transversus abdominis supported by the rectus abdominis — in effecting a narrowing of the abdominal cavity prevents ptosis of the viscera: we may call it splanchnoptosia or enteroptosia, both terms meaning exactly the same; namely, sinking of viscera. When these muscles become atonic — that means relaxed — and their fasciæ and tendons flaccid, ptosis of the viscera will occur.

It is difficult to say which is of primary and which of secondary importance among the functions of the abdominal muscles: certain it is that they also exert a significant influence on abdominal innervation, and control the distribution of fluids in the abdomen, both in the abdominal viscera and abdominal tissues. In order to understand the functional relation of the abdominal muscles in regard to circulation and innervation, we have to consider the physiology of circulation from a new point of view which has been supplied by Dr. Groddeck of Baden Baden.

There are mechanical forces in our body which distribute the fluids. It is not the heart alone which moves the water, for there are fluctuations of fluids in the body upon which the heart exercises no influence. The water in the human body is in constant motion, and the quantity of fluids in the various parts of the body is constantly changing. The distribution in the body takes place in a threefold manner: 1. As blood or lymph in the vessels; 2. As tissue juice in certain spaces between and within the organs; 3. As constituting the most important part of the cells. A common feature of these three systems consists in the fact that they may be mechanically dilated or

compressed, and that they are also dilatable and compressible of their own force.

The fluid contents of any part of the body may depend upon the condition of the tissue and be totally independent of the blood circulation in the vessels, because the distribution of blood or water is partly regulated by the function of the muscles and the influence of this function on the vasomotor nerves. The distribution of water, however, also depends on the circumstances and surroundings under which the blood-vessels are imbedded. The greatest restrictions exist in the cranial cavity, where the variations of the circulation are perceptible more quickly and more intensely than anywhere else. The least restriction is offered by the abdomen, the most important organ for the distribution of water, where the fluid variations assume the largest dimensions.

The task of moving the water devolves upon the heart, which, for this purpose, requires a certain force. Whenever the equilibrium between task and power of the heart is disturbed, we have to reduce the resistance in the circulation, thus facilitating cardiac function. The attempt to raise the functional power of the heart is not attended with permanent success. In order to alleviate cardiac function, we have, above all, to regulate the mechanical forces in the body which distribute the fluids, but in order to be able to regulate these forces, it is necessary first to know them.

The most important active force of water is its gravity. It flows from above downward. If, now, gravitation were the only point to be considered, the parts situated at a lower level should contain the most water, so that the lower extremities would be in a constant state of hyperæmia or œdema, because the cardiac systole is not powerful enough to drive the venous blood back into the heart. Here, now, come the nervi irrigentes into play: they dilate the veins, and the vascular dilatation creates a vacuum which is to be filled; in other words, suction takes place. The heart is not only a pressure-pump, as was taught by Harvey, and as has been the teaching for centuries: it is also a suction-pump. The interdependence of the pressure and the suction forces is subject to changes; in health, they balance each other. The motion of the arterial blood is effected by pressure (action of the heart and hydraulic pressure), that of the venous blood by suction, and that of the capillaries by both pressure and suction.

The heart sets the blood in motion, the vessels distribute it, but the sanguineousness of a part of the body depends less on its vascularity than on the number and extent of its capillaries. Such extent is variable, and the fluid motion in the capillaries is regulated by a nervous system, the susceptibility of which is subject to great variations. Each muscle is both a pressure and suction pump, which exerts an effect upon the distribution of the blood, especially in the capillaries and in the distribution of fluids in the tissues. Relaxed tissues absorb fluids more readily; a fact which accounts for the obstinate hemorrhages ex atonia, post-partum hemorrhages, and climacteric hemorrhages which resist treatment by curettage, but are controlled when the tonus of the

abdominal muscles has been re-established by means of proper bandaging. The same applies to chronic diarrhœa caused by atonia gastrica, which will resist all medication and dietetic rules until the cause — the atonia — has been overcome. This has been observed by me, and simultaneously, but independently, by Dr. W. Rosewater of Cleveland, Ohio, who also simultaneously, but independently, suggested and published the method of plaster strapping of the abdomen in case of gastroptosia.

The uniformly distributed pressure when an adhesive plaster belt is applied to the abdominal wall has not only the effect of acting on the tonus of the abdominal muscles, and thus indirectly on the circulation, but it also exerts a direct influence on the circulation, which is to be compared with the action of plaster-of-Paris application in arthritis; there is a direct effect on the vasomotor nerves of the capillaries which vessels under the irritation caused by pressure become dilated, and consequently the blood circulation is accelerated. This is a special factor, aiding to restore normal distribution of fluids in the abdomen.

These facts sufficiently show that the abdominal muscles have a much greater significance than has hitherto been recognized; they also demonstrate what relation their relaxation has to various pathological conditions and what we may learn therefrom for the practical purposes of therapy.

Part of the manifestations of gastroptosia is a floating kidney. Unless there are special complications, it will be sufficient to support the abdominal wall by an adhesive plaster bandage to return the prolapsed kidney to its physiological position and to retain it there. In selecting the therapy, our first endeavor must be to remove the pathological cause, and this we effect in nephroptosia by applying an adhesive plaster, by which the tonus of the abdominal wall is re-established.

Chololithiasis always depends chiefly on bilious stagnation, and perhaps in the majority of cases such bilious stagnation is a consequence of atonia gastrica. Removal of the latter is unquestionably a prophylactic measure against gall-stone formation. In gall-stone colic this procedure constitutes a prompt remedy in perhaps the vast majority of cases. It evidently holds the gall-stones in a firm position, and explains the relief from pain after the application of the bandage.

The relaxation of the abdominal muscles may be the cause of manifold nervous disorders; in many cases it is the sole cause of neurasthenic or hysteric symptoms; among others, of so-called nervous dyspepsia. The proof that this may be so is furnished by the fact that in many cases the nervous symptoms disappear as soon as the relaxation of the abdominal wall has been overcome.

There is a connection between certain cases of dysmenorrhœa and atonia gastrica — all pelvic organs, in fact — the stomach, the intestines, kidneys, liver, uterus — may be involved in different ways by relaxation of the abdominal wall. (I have published a case of dysmenorrhœa of ten years' duration

which had resisted all kinds of therapeutic measures, and in which there was no further pain with the catamenia after the atonia gastrica had been relieved by means of the plaster belt.)

In this category belong the observations which I have made jointly with Dr. Robert C. Kemp in the treatment of colica mucosa, demonstrating as we did that in those cases which we treated with adhesive plaster bandages the symptoms disappeared, and, indeed, permanent cures resulted. This is a clear proof of the connection between atonia gastrica and colica mucosa, but whether such connection exists in all cases is a question which only continued observations can answer.

How little thought has been given to the possibility of a connection between atonia gastrica and intestinal hemorrhages in some cases is well illustrated by a discussion which recently took place on presentation of the following case: A well-known pathologist published a case of fatal enterorrhagia, "in which the exact nature of the trouble could not be ascertained." He enumerated that there was no ulcer in the stomach, no ulcer in the duodenum, and that an exploratory laparotomy did not disclose a malignant growth. After having recovered from the laparotomy, the patient was subjected to gastro-enterotomy (wrongly called gastro-enterostomy), and he died thirty hours after this operation. On necropsy it was found that there were no erosions, no varicose veins, no aneurysmatic dilatation of the arterioles. From the pylorus down to the anus, no gross lesions of the intestines could be made out; excluded were, also, pulmonary and cardiac diseases, philhemorrhagia, varices of the œsophagus. The author concluded his report as follows: "The case appears to be one of the very rare instances of hemorrhage from the gastro-intestinal tract without apparent lesions." Whether this was a case of hemorrhagia ex atonia, I cannot say, but the fact is, that the author never considered this possibility — did not mention, at least, that he had ascertained whether the abdominal wall was relaxed or not. None of those taking part in the discussion of this case, except myself, suggested the possibility of hemorrhagia ex atonia, nor was the theory, advanced by me, considered by any of the audience.

I have convinced myself that in disturbances of the circulation in consequence of cardiac and hepatic disorders, ascites may be successfully reduced and the general well-being improved by supporting the abdominal muscles. Groddeck described a case of myocarditis in which the cardiac function was relieved by the support of the abdominal wall, and I have myself witnessed a surprisingly prompt improvement in similar cases. At the same time I wish to sound a note of warning to proceed with due precaution, as too sudden and extensive a change in the fluid motion of the abdomen may lead to collapse.

Tuberculous patients suffer from gastroptosia, and in many cases digestion is considerably interfered with by the relaxation of the abdominal muscles and the ptosis and dilatation of the stomach connected therewith; indeed, reflex vomiting and reflex coughing may be occasioned by gastroptosia. This is a

fact which can be substantiated, if these symptoms, namely, dyspepsia, reflex vomiting, and reflex coughing, be relieved after the abdominal muscles have received support.

Dr. Walter N. Clemm of Darmstadt, Germany, to whom I am indebted for having introduced into Germany my method of treating atonia gastrica, has called attention to the advantages derived from the support of the abdominal muscles in the case of gastric ulcers. Dr. R. Weissmann of Lindenfels, Germany, has likewise contributed to the medical literature on the method of treatment proposed by me, and my thanks are equally due to him. Dr. B. Schmitz of Bad Wildungen, Germany, recognized the importance of relaxed abdominal muscles in nephritis, and described the salutary influence of supporting these muscles, and thereby improving the circulation, in Bright's disease, before he was acquainted with my method of procedure.

In short, it is evident what far-reaching and multifarious, hitherto unrecognized relations the relaxation of the abdominal muscles may have to a number of pathological conditions.

We have seen that the distribution of water in the abdomen depends to a large extent on the action of the vasomotor nerves of the capillaries; that the abdominal muscles exercise a powerful influence on the vasomotor nerves; that such is demonstrable by the effect which the relaxation of these muscles may have upon the distribution of water in the abdomen.

According to observations made by Dr. Robert C. Kemp and myself, there are cases of atonia gastrica in which there is no general atony, and where patients, in spite of a relaxation of the abdominal muscles, are full of muscular force. In these cases the only manifestation of the relaxed abdominal wall is the presence of hyperchlorhydria. In his clinic at the Manhattan State Hospital, Dr. Kemp has made very concise observations on the connection between atonia gastrica and hyperchlorhydria, demonstrating by repeated examinations of the stomach contents, in cases of this kind, the process by which this abnormal secretion is benefited by the application of an adhesive plaster bandage.

It is also a fact that there are cases of considerable derangement of the fluid movements in the abdomen in consequence of general atony, and I will conclude my dissertation by the citation of a historic case, from which it is apparent how the vasomotor nerves may be influenced from the nerve center.

In the beginning of May, 1812, Napoleon's army arrived at the frontier of Poland, whence it proceeded by forced and most tiresome marches to the river Niemen, which forms the boundary between Lithuania and Poland, arriving at the borders of the river in the middle of June. An immense body of soldiers met near the city of Kowno, crossed the Niemen on pontoons, and formed, under the eyes of the Emperor, in endless battle line on the other side. The forced march continued day and night over the sandy soil of Poland. The tropical heat during the day and the low temperature at night, the frequent rainstorms from the north, the camping on bare and often wet

ground, the ever-increasing want of pure water and fresh provisions, the immense masses of dust which, cloudlike, hung over the marching columns — all these difficulties together had sapped the strength of the soldiers even in the beginning of the campaign. Many were taken sick before they reached the Niemen. The march through Lithuania was hastened as much as the march through Poland. Provisions became scarcer all the time; meat from cattle that had suffered from starvation and exhaustion was for a long time the soldiers' only food. The great heat, and the inhalation of sand and dust, dried the tissues of the body, and the thirsty soldiers longed in vain for a drink of water. Often there was no other opportunity to quench the thirst than that afforded by the swamps. The officers were powerless to prevent the soldiers from kneeling down at the stagnant pools and drinking the foul water without stint. Thus the army, tired to the utmost from over-exertion and privation, and disposed to sickness, entered the land of the enemy. The forced marches were continued during the heat of the day, through sand and dust, until stormy weather set in with rain, followed by cold winds. With the appearance of bad weather, a general diarrhœa, which had already been observed at the time of crossing the Niemen, showed itself with greater severity. The route the army had taken from camp to camp was marked by offensive evacuations. The number of the sick became so great that they could not all be attended to, and medical treatment became illusory when the supply of medicaments was exhausted.

The greater part of the army fought in vain, however courageously, against the extending evil. As everything was wanting of which the sick were in need, there was no barrier against the spread of the disease, while at the same time the privations and hardships which had caused it continued and reached their climax. Some of these soldiers would march, equipped with knapsack and arms, apparently in good spirits, but suddenly would succumb and die. Others, especially those of a strong constitution, would become melancholic and commit suicide. The number of deaths increased from day to day.

Marvelous was the effect of mental emotions on the disease. Surgeon-General von Kohlreuter, during and after the battle of Smolensk, witnessed this influence. Of four thousand Württembergians who took part in that battle, there were few quite free from dysentery. Tired and depressed, the army dragged along; but as soon as the soldiers heard the cannon in the distance, telling them the battle was beginning, they emerged at once from their lethargy; the expression of their faces, which had been one of sadness, changed to one of joy and hilarity. Joyfully and with great bravery they went into action. During the four days that the battle lasted, and for some days afterward, dysentery disappeared as if banished by magic power. When the battle was over and the privations were the same as before, the disease returned with the same severity as before — nay, even worse, and the soldiers fell into complete lethargy.

EDITORIALS

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NOVEMBER, 1906

ECLAMPSIA

Recent years have seen a considerable addition to our knowledge of the pathology and treatment of eclampsia, and a summary of the present status may not be amiss.

Two distinct views concerning the pathology and treatment of this affection are prevalent to-day. The first is the old and most widely received belief that eclampsia is dependent upon or invariably connected with disease of the kidneys; that its presence or threatened development may be appreciated by the study of the urine; that it is a kidney condition, peculiar to pregnancy; and that it is best cured by immediately terminating pregnancy. Some hold that eclampsia is of unknown origin, but invariably connected with pregnancy; that no time should be wasted in discussing its pathology, but that pregnancy should be terminated as quickly as possible. These views represent the older belief upon the subject.

The newer pathology regarding eclampsia considers the condition the result of a general toxæmia, manifesting itself in the alteration of the blood and exhibiting its lesions most pronouncedly in the liver, lungs, kidneys, spleen, and other viscera. This condition may attack an organism not pregnant, for the fœtus, or infant after birth, may have toxæmia and eclampsia, with lesions, symptoms, and clinical course exactly like those of the parturient woman. Eclampsia may also develop after the termination of pregnancy.

The predominant symptom in this toxæmia is deranged metabolism and abnormal disposition of nitrogenous matter. The exact links in this chain are, at present, not clear; ferments produced by living tissue derived from fœtal elements, as the chorion, may contribute; bacteria may, as in other processes, assist in the attack upon the patient's blood.

Toxæmia and eclampsia cannot be diagnosticated accurately by the examination of the urine alone. In some cases the kidneys and their secretion are practically unaltered. Recognition of the condition demands thorough scrutiny of the patient as an organism; the nervous system furnishes most valuable information, through altered pulse tension, intoxicated cerebrum, abnormal reflexes, disordered secretions, and, finally, explosion of energy. Information concerning the patient's metabolism may be obtained by studying the digestive tract, the blood, the excretions, the urine, and physical examination of the viscera.

According to modern belief, the treatment of toxæmia and eclampsia is based upon an accurate knowledge of its pathology and a critical observation of the efforts made by Nature to rescue the patient. It is a clinical fact that patients recover spontaneously from toxæmia and eclampsia. The obstetrician,

then, must beware, lest his efforts hinder rather than help. It is observed that those cases that tend to recovery are cases where the blood is not extensively involved, where the functions of the liver are fairly well performed, but where the kidneys seem congested with the free discharge of serum-albumin into the urine. If these patients be placed upon a milk diet, with hot packs, purgation, and the plentiful use of water, they tend to recovery. Many of them retain the fœtus and carry it living to full term.

Those cases of toxæmia and eclampsia in which the blood is most disorganized and the functions of the liver most disturbed tend distinctly to death. In these cases where toxæmia has advanced to the point of producing multiple hemorrhages in the parenchyma of the liver and lungs, recovery is exceedingly rare. Treatment should be addressed to modifying the condition of the blood, by bleeding and intravenous saline transfusion, stimulating elimination by purgation, lavage of the stomach, and hot packs, and supporting the strength of the patient. That method of delivery may be selected which will produce the least shock to the patient and the least traumatism, thus avoiding the production of an increased quantity of fibrin-ferment to add to the patient's danger of multiple thrombosis and embolism. It is usually best to wait until Nature begins labor, then completing it in the simplest manner possible; theoretically, in severe cases, Cæsarean section is often indicated; practically, it is rarely possible to perform the operation under satisfactory conditions.

Obviously, the treatment of toxæmia and eclampsia is most successful in prophylaxis by selected diet, well-ordered hygiene, tonics, remedies addressed to elimination, abundant rest, and constant fresh air.

In the treatment of actual eclampsia we do not believe that the emptying of the uterus, where Nature makes no effort to expel the fœtus, is of benefit to the patient; where, however, the cervix is softened and obliterated, labor pains are to some extent present, and the patient is making an effort to discharge the fœtus, this effort should be assisted.

No one can give a definite and intelligent prognosis concerning a case of eclampsia; in these and in many other respects the analogy between eclampsia and pneumonia is very close. Favorable symptoms are, lessened cerebral intoxication, the resistance of the heart to the depressing poison, the diminution in number and violence of the fits, and failure of pulmonary œdema to develop. Unfavorable symptoms are, prolonged coma, pulmonary œdema, rapid pulse, high temperature, and the discharge from the stomach or bowels of coffee-ground material.

Attention may be called to those cases of fulminant toxæmia with eclampsia, produced by great changes in temperature; exposure to cold may be followed by severe visceral congestion with symptoms of threatened eclampsia. Not less frequently, during times of intense heat, pregnant patients may develop eclampsia without warning, passing into a condition closely analogous to heat or sunstroke; these are among the especially dangerous cases, and demand prompt and thorough treatment. EDWARD P. DAVIS, M. D.

ENDOWMENT OF MEDICAL COLLEGES

Until a comparatively few years ago all our medical schools, even the few connected with universities, were private proprietary schools. The faculties took all the fees, paid all the expenses, and divided the profits. In a successful school the profits were large, especially if the expenses were kept down to the minimum. To these direct profits were

to be added the indirect income from professorial position and distinction. As Prof. H. P. Bowditch well said, one might as well expect the public to endow a cotton-mill as such a medical school.

But now all this is changed, and there remain very few such proprietary schools. This change has been accompanied, also, with such radical changes in the scope and methods of instruction as to render the income of the school from fees wholly inadequate to defray the greatly increased expenses. Hence large endowments are absolutely necessary.

With praiseworthy self-sacrifice the faculties of these schools have accepted, and indeed often voluntarily proposed, large reductions in their own salaries, in order that the facilities for instruction should be adequately increased.

Why should any medical school be endowed? it may be asked. I answer the question by asking another, Why should any university or college be endowed? The reply to each question is the same. It is to the interest of the entire community that our youth, and especially our physicians, shall be well educated. The cost of a modern medical education in a university, with its library facilities, its museums, its laboratories, its grounds and buildings, its well-equipped hospital, and, above all, its large number of thoroughly trained teachers, is such that if the resources from which the expenses can be paid are to be restricted to the fees paid by the students, only the rich and the well-to-do could afford such an expensive luxury, or else the educational facilities must be more meager. Were our universities, colleges, and professional and technical schools limited to these relatively few rich students — and the great mass of sturdy, progressive, enthusiastic, and able students from the ranks of those whose income barely meets their expenses, or even from the ranks of the poor, hungering and thirsting for knowledge and the opportunity, were excluded — it would be a sad day for the intellectual and scientific development of our nation.

In medicine, even more than in languages, history, belles-lettres, and similar studies, are endowments needed, because in that department expenses have made giant strides, and fees increased only at a snail's pace.

Professor Bardeen, in his address, "Anatomy in America,"[1] gives a table, an analysis of which shows that from 1875 to 1901 the number of students increased threefold, while the number of instructors increased fivefold. In 1875 there were 8.75 students to each instructor; in 1901, 5.33; and if the clinical instructors in hospitals had been included, I doubt not that there would be found one instructor for every four, and possibly for every three, students. In 1862, when I graduated, there were fewer than a score of instructors in the Jefferson Medical College; now there are over eleven score — an increase of over eleven hundred per cent.

Medical instruction, therefore, is manifestly becoming more and more individual, and therefore more and more expensive. Yet in forty years the average fees of the leading medical schools have in most cases less than doubled.

See what the state does in France and Germany. In the universities of Paris, Bordeaux, Lille, Lyons, Montpellier, Nancy, and Algiers, the last published report shows that the funds and fees of these seven universities yielded $101,694, while the government contributed $525,659 — over fivefold.

In Germany, in 1903, the receipts of their twenty-one universities from their own investments and fees were $2,443,651, while the state furnished $4,758,217.

In America we must rely upon private munificence for such aid — and our reliance will

[1] *Bulletin University of Wisconsin*, No. 5, Science Series No. 4, Sept., 1905.

not be in vain. The idea of such endowment is in the air, and soon it will be a reproach to a rich man's memory if he does not leave large sums for such purpose, unless, happily, he has given freely in his lifetime and has had the delight of seeing its fruitage while alive and able to enjoy it.

Since 1900, when I urged the importance of such endowments before the American Medical Association, there have been given to nine medical schools in Philadelphia, New York, Chicago, Boston, Baltimore, and New Orleans over six million dollars, partly to the hospitals of these schools, but the bulk of it for an increase in the medical plant, as in the noble new medical buildings of Harvard, or for endowment proper. Yet Charles Francis Adams calls for twenty million dollars more for Harvard endowment, and Professor Pickering of the same university is clamoring for a few millions more for astronomy alone!

Moreover, the importance of the "research-habit" itself, which President Pritchett has well termed the most valuable asset of Germany, has been recognized as never before. Witness the cancer laboratories in Boston and Buffalo, the Phipps Institutes in Philadelphia and Baltimore, the Carnegie Institution in Washington, the Rockefeller Institute for Medical Research in New York, the Memorial Institute for Infectious Diseases in Chicago, and, abroad, the splendid gifts of Mr. Henry Phipps in India, of the Welcome Laboratory in Khartoum, of Lord Iveagh, and of Mr. Beit, lately announced.

Humanity will be enormously benefited by such gifts, especially those to medical schools. "The medical schools which trained a Jenner, a Lister, and a Koch have done more to relieve the suffering of the human race than all the hospitals of the world." To say nothing of the enormous saving of human lives, who can estimate the mere commercial value of the extinction of yellow fever and the almost-won victory over malaria to the business men of Cuba, New Orleans, Memphis, Mobile, Jacksonville, Savannah, Norfolk, or to the whole nation in the construction of the Panama Canal? It amounts to hundreds of millions, and each year adds its millions upon millions —all due to the medical school, the laboratory, and the wise energy of the men of research—Walter Reed, Carroll, Lazear, and Gorgas.

"If the monetary value of a human life is assumed to be $5,000," says Dr. Daniel Lewis, health commissioner of New York, "the deaths from only *five* of the *preventable* diseases during 1903 in this state [New York] represent a loss of $94,960,000. These figures seem appalling, and yet millions upon millions can properly be added to this sum in loss of wages, expense of the care of the sick, etc."

Hospitals care only for the victims of preventable diseases; medical schools teach how to prevent these preventable diseases.

The members of our profession have the rich and the well-to-do constantly under their care, and if they will, they can reach them by argument and personal influence. It will be our own fault if our medical schools remain so shamefully, so pitifully, so inadequately endowed.

W. W. KEEN, M. D.

TRANSACTIONS OF SOCIETIES

THE CHICAGO GYNECOLOGICAL SOCIETY

RUDOLPH W. HOLMES, M. D., Editor of the Society

Stated meeting, June 15, 1906.

The President, Dr. Frank T. Andrews, in the chair.

Dr. Frank W. Lynch read an inaugural thesis entitled Cystic Kidney in the Fœtus as a Cause of Dystocia, with Report of a Case. (See paper in the present number of Surgery, Gynecology and Obstetrics, p. 628.)

DISCUSSION

Dr. Gustav Kolischer: I think the contribution of Dr. Lynch is a valuable one.

As to the theory suggested, that these cases are due to some neoplastic formation, I am rather inclined to support that view. An interesting feature of the report is, that if this neoplastic theory is correct, we may get some kind of information as to the symptoms such a cystic kindey will produce, or if the individual lives with such a cystic kidney without operation, in later years certain symptoms will develop which were previously obscure.

One of the specimens explains the hemorrhages that occur in cystic kidney from single dilatations. It is easy to see how hemorrhage will occur when we find a blood-vessel, absolutely isolated, running through an empty space. A neoplastic tumor which invades a blood-vessel will lead to hemorrhage in cases of cystic kidney. The kidneys eliminate infectious products or the microbes which circulate in the blood; but if the kidney is weakened in some way — for instance, through a neoplastic growth — the glomeruli and the papillæ may become affected. We know that in tuberculosis one sometimes may see extensive hemorrhages coming from the papillæ. If any infectious matter is circulating in the blood, it is understood how the kidney may become infected, and that will explain the occurrence of pus infection and the appearance of pus in the urine in cases of congenital cystic kidney, which develops later on.

Dr. Robert Gillmore read a paper entitled Insidious Infections of the Kidney in the Young, with Direct Bearing on their Prenatal Origin. (See paper in the present number of Surgery, Gynecology and Obstetrics, p. 621.)

DISCUSSION

Dr. Frank W. Lynch: I was much interested in this paper. It brings up a subject of which we have little actual knowledge. Fœtal pathology is a comparatively unknown subject. In fact, I have found it very difficult to obtain uniform opinions of pathologists as to what constitutes normal fœtal organs. Quite recently I have had this experience in connection with the fœtal liver, and I think it is equally true in connection with the kidney. The subject-matter of the paper under discussion deals with the effect of toxines, and seems to resolve itself into the point, Are toxines transmitted from the mother to the fœtus?

Some years ago I had the opportunity of carefully observing several cases of typhoid during pregnancy, and obtained in one instance the typhoid bacilli from a four months' fœtus. It is noteworthy in this case that although the maternal blood gave a definite Widal in one-to-ten and one-to-fifty dilution, no reaction could be obtained from the fœtal blood, even though it had been found to contain the typhoid bacilli. The case was most instructive, for it clearly showed that the Widal reacting substance had not yet formed in the presence of the typhoid bacilli in the fœtal blood, nor had it filtered through the placenta.

There is much evidence to show that the placenta generally acts as a filter or a barrier to the passage of toxines. There are many cases of typhoid during pregnancy in which the fœtal blood gives a Widal reaction when no organisms can be found to have passed through the placenta, yet in these cases the reaction is much weaker than that given by the maternal blood. Many of these cases have been reported erroneously as proof of fœtal typhoid. The same general principles are illustrated in attempts to secure intrauterine vaccination. I was interested in this subject a few years ago, and attempted to vaccinate the newly born children of mothers who had been vaccinated successfully by me during the last months of their pregnancy. In no instance was I unable to obtain a reaction from vaccination of the newly born child, which experience I found, upon referring to the literature, was the usual result obtained by other observers. Thus in a large number of cases

reported by Gast, Behm, Wolff, and Palm, the uniform experience was that intrauterine vaccination was not possible. Indeed, at the time (1901), Ballantyne was practically the only writer who thought it was possible in anything like a noticeable percentage of cases.

In like manner, if intrauterine vaccination is possible, we should expect that smallpox in the mother during pregnancy would be followed by the same disease in the fœtus, or else the child would receive immunity against the disease. The weight of authority is, that intrauterine smallpox is of rarest occurrence and against the rule. Furthermore, smallpox in the pregnant woman does not confer immunity to the fœtus, for it is well known that unless the newly born child be vaccinated immediately after birth, it may contract the disease and succumb to it.

Our knowledge concerning measles and scarlet fever does not warrant us in drawing conclusions as to the possibility of their passage to the child in utero. The incubation period of these diseases varies greatly. Thus Thomas, in Ziemssen's *Cyclopædia of Medicine*, states that it may be less than twenty-four hours in measles, and if this is true, I do not think we can say anything as to the intrauterine transmission of these diseases unless we can prove the presence of the materies morbi in the blood of the mother and child at birth, and eliminate the *probability* that infection of the child occurred during the passage of the birth-canal.

The paper brought up the question as to the function of the fœtal kidney. All men are not of the opinion that the fœtal kidney does functionate. In fact, up to a recent time, the weight of authority is against this view. Certainly, it is true that fœtal urine contains urea only in the same proproportion as the fœtal blood. Consequently we wonder why there should be an intrauterine nephritis. The sections presented to-night appear to me to show blood in the stroma of the kidney, but there is no increase of connective-tissue cells in the stroma nor in the glomeruli. Degeneration of tubular epithelium is noted in one slide. The sections are most interesting and suggestive, yet I do not think they can be taken to prove absolutely that there is fœtal nephritis and that it has resulted from maternal nephritis.

Dr. Heliodor Schiller: I think Dr. Gillmore's paper furnishes us with an explanation of death in the case of children shortly after they were born, particularly those cases that have not been explained until now.

I remember the case of a pregnant woman who had five per cent of albumin in the urine, two tenths per cent urea, and hyaline and granular casts in the urine. She complained of headache and vomiting; her baby developed convulsions on the third day after confinement, and died in two hours. I catheterized the child and obtained a few drops of urine. There was an enormous amount of albumin and casts in the urine. The urine was not sedimented; plain urine was taken, and the whole field was full of epithelial and red blood-cells and casts.

A week afterwards I saw a woman with the same findings in the urine, who had given birth to a healthy child. I was interested in the condition of the urine of this child. I catheterized the child, and on the second day found in the urine, in one field, three red blood-cells, casts, and epithelial cells, indicating an acute nephritis.

It is interesting to notice that Dr. Lynch found typhoid bacilli in a child, with no agglutination or Widal reaction. It would be interesting to know in which stage of typhoid the mother was. We know that we find typhoid bacilli and no Widal most often in the first eight or ten days, and that the Widal reaction has been missed in distinct cases of typhoid.

Dr. Joseph F. Biehn: I have been much interested in the case reported by Dr. Gillmore, for the reason that I have studied some of the sections, and I find, on examining them and some sections of the liver, adrenals, and pancreas, that there are few or no signs of inflammation. Even these kidneys do not show what a pathologist would call a nephritis, because that implies the presence of blood-vessels and round-cell infiltration, or else infiltration with other leucocytes. We have in the kidneys, liver, adrenals, and pancreas of the cases we have examined a degeneration in a highly specialized portion of the kidney and other organs; that is, the epithelium. We find, for instance, degeneration in all of the organs. There must be some cause for this degeneration. We know that toxines will pass through all the ordinary membranes by the physical phenomenon known as osmosis, and I do not believe that the placenta will withhold toxines, that are necessarily in the mother's blood, from the fœtal blood. That is the only explanation I can see that can be given for the degenerations occurring not only in the kidney of these fœtuses, but also in all of their organs. We find this especially so in the kidney. We do not necessarily imply here that these kidneys have necessarily performed their function of secretion of urine, and that, as a result of secretion, they have separated the toxines from the blood, and therefore have them in greater concentration, and thus are more effective than the other organs which come in contact with the blood. The epithelium

has degenerated as the result of the fact that the toxines are in the blood, and necessarily go to the other portions of the body.

I desire to say that I have found a great many cases in which I have found typical typhoid bacilli at post-mortem examinations. One I remember very well, which was at the end of the sixth week, when we found pure cultures of typhoid bacilli in clumps and masses in all the internal parenchymatous organs. The patient at no time gave a Widal reaction, so that the question as to whether a patient has typhoid or not cannot always be settled by the Widal reaction.

We know that the kidney is one of the most active of all organs, and as has been said in reference to the previous paper, certain bacilli, as tubercle bacilli, are excreted by the kidney. From a pathological standpoint, in making a great many post-mortems, statistics will show that the kidney is less liable to infection, such as tuberculosis, than any other organ. We may find all organs in a tubercular condition, but the kidney is the only organ that escapes. It is not the germ itself that is the essential cause of this trouble, but some product of the germ. Some of these specimens are not the best ones we have, but all of these kidneys show marked fatty degeneration. We have some granulation tissue and obscuring of the nucleus in all these cases, showing that there is some subtle poison that has affected the epithelium. These cases are not what we call a true nephritis, because we do not find the typical signs of nephritis. We do not find marked round-cell infiltration and hyperæmia.

Dr. Joseph B. De Lee: I am inclined to agree with Dr. Gillmore in regard to the permeability of the fœtal kidneys to poisons circulating in the blood of the mother. I believe the mass of evidence is entirely in favor of that view.

Regarding Dr. Lynch's statement, that the majority of accoucheurs and pathologists believe that the kidneys do not secrete during pregnancy, the opposite, so far as I can remember, is true. It is the belief of the majority that the kidney does secrete during pregnancy, and that non-secretion is the exception. Ahlfeld was one of the first, if not the first, to defend the theory that the fœtal kidney does not secrete during pregnancy, and he brings to bear several points in defense of that theory: 1. That the amount of urea in the liquor amnii is very little greater than the amount of urea in the maternal blood; 2. That the number of children that pass water directly after birth is very small compared with that of those that allow twelve to sixteen hours to elapse before the first urination; 3. That the contents of the so-called hydronephrotic sacs are not urine, but other liquids, the composition of which does not resemble urine. One other point he brings up in defense of his theory. In certain cases, where the bag of waters ruptured thirty days before delivery, he had the discharges collected and sent to the laboratory, with the result that only the finest traces of urea were found.

Ahlfeld's defense is a good one, but the majority of men would, *a priori*, assert that the fœtal kidney does usually secrete. The French all believe that the fœtal kidney secretes, and they claim to have found large amounts of urea in the liquor amnii. That the child can become not only nephritic, but also uræmic, from the mother I be ieve from clinical experience, without doubt. I was once called to see a woman who had been de ivered of twins before I saw her. One died in convulsions two hours after delivery, and the other had typical uræmic convulsions, and died twelve hours after delivery. The mother was a typical nephritic of many years' standing, and had albuminuric retinitis.

Paul Bar has examined children from 95 eclamptics, and, I think, with hardly an exception, has found evidence of nephritis in the children, or degenerative changes in the kidneys and pathological findings in the urine of those children that lived. That poisons can pass from the mother to the fœtus is without doubt — chemical poisons — and it is not going too far to say that organic poisons will also be transmitted. That methylene blue can be transmitted from the child to the mother has been proven by French observers, quoted by Planchu. These men injected methyl blue into the scalp of a baby before it was delivered, and could demonstrate it chemically in the urine of the mother. If that can be transmitted so rapidly from the child to the mother, it goes without saying that the opposite course should be true.

Dr. Gustav Kolischer: I have been very much interested in Dr. Gillmore's paper. He has made a suggestion that points to the possibility of poisons passing into the fœtal circulation and causing disturbance in the kidneys of the fœtus, if the mother become nephritic because of certain poisons circulating in the blood. Personally, I am inclined to look favorably on that theory. I believe eclampsia is not due to a kidney lesion, but, speaking in a general way, I think the disturbance in the kidney is due to the condition of eclampsia. Of course I cannot prove this.

In the same way, some gentlemen believe that toxines pass through the placenta. Every one is entitled to his belief; but if one wants others to believe as he does, he should prove his belief. If

we find in the mother certain disturbances of the kidney, a degeneration of the epithelial structures, or a degeneration of the more highly differentiated cells, it does not prove that this nephritis is due to the same causes as the degeneration of the epithelium in the fœtal kidney. It is by no means proven that, in eclampsia, nephritis in the mother causes the same condition in the child. If it is true that the placenta is apt to poison the mother, we can very readily understand, by the same method of reasoning, how it may affect the fœtus, so that the mother and child are affected from the same source, only the phenomena which are the consequence of this infection and the circulation of the poison manifest themselves in a different way in the mother from that in the child. The mere coincidence that we find degenerated epithelium, or that a few blood-vessels are congested, does not prove that the mother has transmitted the toxine or toxines to the child or fœtus. We have the same right to believe that the placenta may infect both mother and child. That is a matter of belief, and Dr. Gillmore did not say that a nephritic mother would produce a nephritic child. We must, however, admit the possibility that he pointed to.

As to the question of secretion of the kidney of the fœtus, it is not a question whether the kidney secretes, but of what the kidneys are secreting. Are they secreting true urine? That is the point at issue.

As to the reports of French authors, I confess I never accept them with a view of deciding a question on one side or the other, and I think most men here will understand why I need not go further after making this statement. (Laughter.)

The suggestion of Dr. Gillmore is a very valuable and important one; namely, that this field should be explored further; but I think the other gentlemen have tried to prove more than Dr. Gillmore stated.

Dr. Charles E. Paddock: I agree with the French observers, that the fœtal kidney does secrete, and that we have clinical evidence of that fact. The reason, in my judgment, why we find the bladder empty in a child that does not pass urine under twenty-four hours is the abdominal pressure; that is, the child, in passing down, causes pressure, and that pressure affects the fœtal bladder. In the majority of breech cases, as soon as the genitals are born, we find them passing fluid which I call urine. In the case of still-born children I have opened the bladder and found a large amount of fluid there, and until somebody proves that it is not urine, I shall call it urine.

Dr. Kolischer: Does Dr. Paddock call every fluid he finds in a preformed cavity urine?

Dr. Paddock: I do, in the bladder, but not in every cavity.

Dr. Kolischer: And until it is disproven not to be such, you call it urine?

Dr. Paddock: Yes, sir.

Dr. Kolischer: That is what I said before; everybody is entitled to his belief. (Laughter.)

Dr. Gillmore (closing the discussion): There are several points that might be considered at length, but I shall be brief.

In regard to the question whether true urine is secreted by the fœtal kidney or not, there have been several cases reported where sodium benzoate was given to the mother before labor, and the pure acid was found in the amniotic liquor. This would suggest, therefore, that the fœtal kidney secretes. Again, the fact that methylene blue administered to the mother has been found in the fluid of the bladder of the child proves that the fœtal kidneys secrete fluid, and that the methylene blue must have passed through them — it may be as a filter. Urea has also been demonstrated in the fluid of the bladder of those children who have died, whose mothers were eclamptic.

There are one or two points in prenatal pathology that are confusing. One of them is, whether chloroform, when it is administered to the mother, is eliminated by the kidneys of the fœtus, and is thus responsible for nephritis in the infant. I did not present that feature in the paper, because I had no suggestive data relevant to this question.

It is difficult to determine the permeability of the placenta by toxines, and whether toxines, when administered to the mother, pass into the fœtal blood, and tests should be made on human beings, rather than on the lower animals. It seems to be easier for toxines to pass through the placentæ of some animals than it is in others, on account of a varying permeability. By examining a great many placentæ microscopically we may eventually get valuable data.

AMERICAN ASSOCIATION OF OBSTETRICIANS AND GYNECOLOGISTS

Nineteenth annual meeting, held at Cincinnati, Ohio, September 20, 21, and 22, 1906, under the presidency of DR. JOHN YOUNG BROWN of St. Louis, Missouri.

KIDNEY AND COLON SUSPENSION BY THE USE OF THE NEPHROCOLIC LIGAMENT AND GEROTA'S CAPSULE

DR. HOWARD W. LONGYEAR of Detroit said the ligament is described as formed of an aggregation of fine fasciculi originating in and being identical with the fibrous tissue forming the framework of the fatty capsule of the kidney, which, after enveloping the kidney in a fine network, passed downward and were inserted into the posterior wall of the ascending colon on the right side and the descending colon on the left side. Its structure, as well as its action, might be compared to that of the network covering a balloon, the cords of which descended downward and supported the car. The kidney was the balloon and the cæcum the car; the kidney descended or did not, according to the laxity of its supports and the degree of traction exerted on it by the cæcum.

Dr. Longyear claimed that the traction thus exerted on the kidney by the bowel was the prime factor in the causation of nephroptosis, and as the duodenum was also displaced by reason of its adherence to the fatty capsule, the first object of attainment in any operative procedure should be the suspension of the bowel. To do this he isolated the nephrocolic ligament through the usual incision (though shorter) in the loin and slung up the bowel by overlapping and sewing flaps made from Gerota's capsule through the loop of the ligament. This also held the kidney in suspension, but this object he considered second in importance to the suspension of the bowel.

FIXATION OF THE KIDNEY BY SHORTENING OF THE NEPHROCOLIC LIGAMENT

DR. CHARLES A. L. REED of Cincinnati presented a brief clinical report of cases operated upon by the application of the principle, but a modification of the technique, as presented by Dr. Longyear at the meeting last year. The essential modification of the technique consisted of the control of the nephrocolic ligament through an oblique incision in the intercostal interval.

THE TECHNIQUE OF KIDNEY FIXATION

DR. J. HENRY CARSTENS of Detroit pointed out that to fix a kidney permanently it was necessary to resect the fibrous capsule and fix this firmly to the muscle as near to the normal position as possible. Only in this way could a kidney be firmly and permanently fixed. He described a simple operation which, he said, could be done in ten minutes, through a very small opening, and said that it would give permanent results, and it seemed to him an ideal method of permanently fixing a kidney.

DISCUSSION

The three preceding papers were discussed jointly.

DR. HERMAN E. HAYD of Buffalo described various methods he had resorted to for fixing a kidney. He said it was not possible to fix a kidney unless one delivered it so as to produce a certain amount of adhesive union between the kidney and the loose structures which it had occupied so long.

DR. EARL HARLAN of Cincinnati said that to understand thoroughly the subject of dislocated kidney, one should be familiar with the normal anatomical relations of the surrounding organs, the nerve-supply and circulation of the parts, and also have a correct knowledge of the attachments and relations of the peritoneum. He called attention to the very wide range of pathological anatomy attendant upon kidney dislocations, and showed that any operative procedures which have for their object the correction of the numerous symptoms connected with this trouble must be based upon a correct rearrangement of the normal anatomy of the parts in the right upper quadrant. He described at length an operative technique which he had found satisfactory, inasmuch as it was based on the normal anatomy of this region.

These papers were further discussed by DRS. JAMES F. BALDWIN, Columbus, Ohio; JOHN B. MURPHY, Chicago; and JOSEPH PRICE, Philadelphia, all of whom described methods of anchoring loose or floating kidneys.

PORRO CÆSAREAN SECTION FOR PREGNANCY WITH COMPLICATING FIBROIDS

DR. JAMES F. BALDWIN of Columbus, Ohio, said statistics show that in cases of pregnancy complicated with fibroids, unless the latter were so small as to be negligible, a maternal mortality of over thirty per cent and a fœtal mortality of probably fifty per cent obtained. Porro Cæsarean section, with proper surroundings and a competent operator, should give a maternal mortality of only about five per cent, and practically no fœtal mortality whatever. Hence this operation should be uniformly advised in this class of cases.

UTERINE FIBROIDS COMPLICATING PREGNANCY

DR. MARCUS ROSENWASSER of Cleveland said the recent report of cases of uterine fibroids obstructing delivery, in which the lives of mother and child were seriously endangered in the effort to deliver by the natural channel, justified operators in reporting the cases relieved by Cæsarean section for the purpose of establishing the latter as a safer and better method of saving both lives.

The report of a Porro Cæsarean section successfully terminated was made as an additional contribution to papers previously read before the Association and published in its Transactions of 1896 and 1899. In this case the pelvis was obstructed by an immovable subperitoneal fibroid located in the posterior wall of the lower uterine segment. The operation had been planned for the onset of labor at term, but, owing to rupture of membranes and prolapse of cord, became an emergency operation at the beginning of the ninth month. Mother and child were saved.

DISCUSSION

DR. E. GUSTAV ZINKE of Cincinnati said he had delivered two women in whom tumor was discovered after delivery, not before. The tumors were intramural, very small, one the size of a walnut, the other the size of a hen's egg. It was different, however, when one had to deal with interstitial fibroids which implicated the intrauterine wall. The first case he had seen was one of this character. It had been in the hands of a midwife, and when she failed to deliver the woman, a physician was called in to assist. This was twelve years ago. As it was impossible to effect delivery in the usual manner, the speaker was called in, and he did a Cæsarean section. The fœtus had been dead for some time, and the woman died within forty-eight hours, of sepsis. Where pregnancy was far advanced and a fibroid tumor was recognized, it was an extreme source of danger to the woman, especially if it was subperitoneal. He thought Cæsarean section gave the woman, as well as the child, the best chance for their lives.

DR. OSCAR H. ELBRECHT of St. Louis, Missouri, mentioned a case of fibroid tumor complicating pregnancy at the fourth month. It was subperitoneal, situated in the anterior uterine wall. He removed the tumor, and patient went to full term.

DR. ROBERT T. MORRIS of New York operated for the removal of a subperitoneal fibroid at the fifth month of pregnancy, in a patient who was having a miscarriage. He operated with a desperate chance of trying to save the child. The patient was nearly fifty years of age — her only pregnancy — and a great deal depended on the birth of a child in the family. The labor pains ceased after he had removed a fibroid about as large as his fist. The patient went on to full term, and was delivered of a living child.

DR. EDWARD J. ILL of Newark, New Jersey, did not think the impression should be permitted to go out from the Association that every woman who had fibroids should have the uterus removed or a Cæsarean section done. The indication should be drawn closely. If there was obstruction in labor, then operation was indicated. With all the cases he had seen — he did not recall how many — he had only once done a Cæsarean section for fibroids.

DR. JOSEPH PRICE of Philadelphia said that these cases, particularly those with pedunculated fibroids, when recognized early, if they fell into the hands of skillful operators, could be operated and the fibroids removed, the patients going on to term, and without premature deliveries or abortions. He cited several cases in point.

DR. FREDERICK BLUME of Pittsburg cited a case in which he did a supravaginal hysterectomy for a fibroid tumor complicating pregnancy. He mentioned one case in which there was a tumor an inch above the umbilicus, fluctuating, the size of a three months' pregnancy. He thought it was simply an ovarian cyst complicating pregnancy. He operated, and found that it did not look like an ovarian cyst, but like the uterus. He enlarged his incision, and found it was the uterus, seven months advanced in pregnancy, and the other was a fibroid tumor projecting into the pelvis. He sewed up the wound. He would operate if the child was viable. The woman insisted on being delivered without any operation. He subsequently delivered her of a nine-pound child, but took the liberty of removing the uterus, as she was forty-five years of age. It was a breech presentation. The child was dead. The woman, however, got along very well. This case showed that fibroid tumors did not disappear after delivery. Here the tumor grew in six months to such an extent that it became necessary to do a supravaginal hysterectomy. He would not like it to go out that a woman who has a fibroid complicating pregnancy should undergo a Cæsarean section.

DR. HUGO O. PANTZER of Indianapolis cited a number of cases of fibroid tumors complicating pregnancy. He was called to see the first after the expiration of ten days. The woman had given birth to a little child, had developed fever, and at this time was passing a fibroid which had become gangrenous. In the second case, he had been called to deliver a woman who had been in labor forty-eight hours. A large tumor was found located at the fundus, and within four days this tumor sloughed away. In the first case the sloughing

fibroid was removed with forceps; the patient made a good recovery, and has since again become pregnant. In the second case the tumor gave evidence of sloughing on the third day after delivery, and within twenty-four hours he operated per vaginam, removed the fibroid, and the woman recovered.

Dr. J. Henry Carstens of Detroit said that fibroid tumors were quite frequently detected during pregnancy. If one found a small fibroid in the cervix which caused symptoms, it could be removed per vaginam when the woman was pregnant, which would save her a severe labor. If the fibroid was a large one and situated higher up, and there was likelihood of its interference with labor, one could operate and remove the tumor whether the woman was three or six months advanced in pregnancy, and save her future trouble. If the uterus contained multiple fibroids, and there was good reason to suspect considerable trouble on account of their interference with pregnancy, he thought it would be well to do either an abdominal or supravaginal hysterectomy, according to the particular case. If one was required to do a Cæsarean section, and there was a very large fibroid to deal with, the fibroid should be removed and the uterus saved.

ABDOMINAL SECTION FOR TRAUMA OF THE UTERUS

Dr. Charles E. Congdon of Buffalo related a case in which there was puncture of the nonpuerperal uterus, with prolapse of the bowel, and violent seizure and tearing away of sixteen inches of gut. Abdominal section with intestinal anastomosis was resorted to promptly, and the uterine laceration repaired and followed by recovery of the patient.

DISCUSSION

Dr. Edwin Walker of Evansville, Indiana, reported a case of rupture of the uterus with prolapse of the intestine. The history was this: He was called in the evening, about eleven o'clock, by a brother practitioner, who had been previously called the same evening, to see a woman who had aborted at about the fourth month, he having been called to deliver the placenta. He used the uterine auger, with which he brought away the placenta, and before he realized it, he had quite a large mass, and on examining it, found it was intestine. There was a handful of intestine presenting at the vulva. Dr. Walker replaced it in the vagina, applied a tight binder, removed the woman to a hospital, opened the abdomen, and found that thirty-one inches by actual measurement with mesentery were torn away. He resected the intestine, used a Murphy button, did not employ any sutures in the uterus, as the parts fell together so well, then closed the abdomen, and the patient made a good recovery. He also mentioned a case in which the uterus was punctured during a curettement.

Dr. Rufus B. Hall of Cincinnati, believed perforation of the uterus was more frequent than most men were willing to admit, especially in producing abortion. He did not believe prolapse of the intestine was frequent in perforation of the uterus. He had an experience a few years ago that impressed forcibly upon his mind the fact that these cases ran in groups. Within eight days he had five patients in the charity ward with perforated uteri, who had produced abortions on themselves. These patients were suffering with various stages of infection. All of them were treated, when there was pus present, with vaginal section, and the pus emptied. Three recovered and two died.

Dr. James F. Baldwin of Columbus, Ohio, related a case which he saw in consultation with Dr. Hall many years ago, the patient having punctured the uterus in trying to bring on abortion. An enormous amount of pus discharged through the vagina, and the woman promptly recovered. He related other instances of perforation.

Dr. Walter B. Dorsett of St. Louis said the cases of rupture or perforation of the uterus should be classified. If asked to attend a case in which there was perforation of the uterus, produced by an abortionist, he would not hesitate to operate. He had operated on three such cases, cleaning out the pus, and putting in vaginal drainage. In one case of rupture of the uterus in labor nothing was done. The intestine was pushed back, and the woman made a very good recovery.

Dr. John Young Brown of St. Louis said that in spite of the teachings of military surgeons, civil surgeons were beginning to realize the importance of penetrating wounds of the abdomen. It did not matter whether the penetration was caused by the curette, bullet, or by stab wound, the consensus or opinion among civil surgeons was that all such wounds should be explored. He had had considerable experience in dealing with injuries of this character, and was firmly convinced that surgeons had learned little or nothing from the statistics that had been presented by men in military practice who had had wide opportunities for observing such wounds. The Transactions of the Society showed an immense amount of splendid work done by the fellows in accentuating and emphasizing the importance of exploring and dealing with wounds of this character.

THE RECTUM IN ITS RELATION TO DISEASES OF WOMEN

Dr. Hugo O. Pantzer of Indianapolis said that the experienced gynecologist was conscious of an important interrelation existing between the rectum

and the female genitalia, as pertains to both health and disease. A faulty function of either of the relevant organs might arrest or modify the function of its neighbor. Chronic constipation, at times, affected the quantity, frequency, or course of the menstrual flow.

Rectal touch was practised very little. Text-books commonly barely mentioned it, much less dilated on it. None spoke of its practical superiority over the vaginal touch. The beginner should employ the rectal touch to get his first true impressions of the pelvic organs in the body, and the expert could not afford to dispense with it. The variable conditions of the rectum, as found by both vaginal and rectal examination, were of great diagnostic and therapeutic interest, and should invariably be noted. The rectum in the multipara always showed deviations from the normal, connected with the events of parturition and puerperality. In sequence these deviations became accentuated. There were remarkable differences recognized which had different bearings, and should have varied treatment, medicinal and operative. The rectal temperature in pelvic diseases had special significance. The oral temperature in these cases was often misleading. The rectal temperature might be anywhere from one half to three degrees more than the oral temperature. The recognition of a febrile disease or its gravity might depend upon this procedure, making it obligatory to take the record of both sites. Text-books were singularly silent on this differential reading.

THE TREND OF THE TIMES IN APPENDICECTOMY

DR. N. STONE SCOTT of Cleveland dealt with the early history of this operation, after which he expressed himself as being fully convinced that the next step in progressive surgery was the perfecting of the technique, with an eye single to the best interests of the patient, even to the smallest detail. Mere recovery was no longer all-sufficient. The ideal condition was health. Operation approached the ideal in proportion to its elimination of time, pain, and danger in illness. These undesirable elements might be more surely and fully eliminated than we had been accustomed to think possible, if, in addition to the essentials heretofore considered necessary, due attention was given to certain points which had been too long neglected. The first of these was the choice of anæsthetics. Ether and choloroform were certainly a great advantage over the methods in vogue prior to their discovery, yet even these were too frequently followed, not only by the expected discomfort, but by disastrous results. The ideal anæsthetic had yet to be discovered. The method of operating was of the utmost importance. The incision should be large enough to give access to the field of operation. The extent of the skin incision was of no importance, in his judgment, except for cosmetic effect. If the patient was fleshy, this superficial cut might of necessity be a long one. In aseptic cases the fascial separation should be only sufficient to admit the tip of the index finger. This was crowded through the soft parts, which were easily dilated to admit the entire length of the finger. Given an anæsthetic with little, if any, attendant nausea, an incision so short as to close of itself, there was no physiological reason for the recumbent posture. The author had gradually shortened not only the incision, but also the time spent by the patient in bed, for not infrequently, whether from physical overwork or nervous strain, patients need and should have a course of the rest-cure. But the ideal operation could be performed only upon an ideal patient; one who was intelligent, obedient, hopeful, and of good recuperative ability, both mental and physical, having well-developed muscle and fascia, without excess of fat, and a movable appendix with a good mesentery; one whose condition was uncomplicated by intercurrent disease or by severe sequelæ, the result of previous attacks. Strong men of independent thought had set out simultaneously and without collaboration to blaze the trail of ideal surgery, while an intelligent and progressive public followed close upon the heels of such frontiersmen. These were unmistakable symptoms of the trend of the times.

POINTS COMMONLY CONTESTED IN THE DIAGNOSIS AND TREATMENT OF APPENDICITIS

DR. JOSEPH PRICE of Philadelphia had found in the reports of some good hospitals that patients suffering from this disease remained in the medical wards until dead, no surgical effort being made to save them. This simply meant that the pure clinician did not yield the point that it was a surgical affection. It also meant that a clinician had not a precise knowledge of pathology; that he had not served his apprenticeship as a resident or as an aid to a surgeon. When the operations for appendicitis were complete, the recoveries and cures pleasing, reopenings or secondary operations for a variety of complications were not necessary. One prominent operator reported twenty-four cases of ileus in his work. This simply meant that his work was defective. Multiple incisions and drains in both the pelvic and abdominal cavities were insults both to surgery and to the peritoneum. Most operators had succeeded in saving their desperate cases by a small or a gen-

erous incision. The multiple incision and drain only favored an additional point for complications. He objected to all imperfect and superficial methods. With a good working knowledge of pathology, one learned, when delayed, that the appendix was deep in the pelvis and loins, and the peritoneal cavity was infected throughout; that toilet and drainage must be quite general, to save such patients. Waiting and watching should not be taught or practised either in private or public under either skilled or unskilled observation. Perforations occurred under the eyes of surgeons, and good clinicians watched and endeavored to limit spreading peritonitis and infection with quick disastrous results. Most good surgeons admitted that they were distressed and unhappy while watching and waiting for an appendicitis that had not been operated upon. A perforation, a spreading infection, did thrice as much harm, and killed thrice as many patients, as an inexperienced operator in an early operation. The patient's chances were lessened by holding off until a well or illy defined multiple abscess or abscesses had formed. The modern pupil possessed refined knowledge of pathology and diagnosis, surgical resources, methods, and materials, and with this splendid preparation for going on with this important work, why should the physician ever leave it to nature or blind chance, or to the watch-and-wait methods? He could easily report long series of recoveries or operations by the hundred with a much lower mortality than the authors of papers crossing the Atlantic to an international congress reporting seventeen deaths in a series of one hundred operations.

THE DIAGNOSIS AND SURGICAL TREATMENT OF INJURIES TO THE DIAPHRAGM

Dr. John Young Brown of St. Louis selected this subject for his presidential adress.

From a careful analysis of the cases coming under his observation he was convinced that there were present in but few of them symptoms on which a positive diagnosis of injury to the diaphragm could be made, and that in many cases when extensive injuries to the abdominal viscera were present the patients were apparently in excellent condition, and presented practically no symptoms. He believed, therefore, that in all penetrating gunshot or stab wounds of the chest, where, from the location of the wound, it was reasonable to conclude that injury to the diaphragm was possible, the existence or non-existence of such injury should be determined by proper exploration. Positive symptoms in these cases were generally the signals of peritonitis, and peritonitis of this character was usually fatal. If this view was correct, how should we explore through the chest or through the abdomen? A penetrating wound of the diaphragm was a penetrating wound of the abdomen, and an exploration to determine the presence of such an injury which did not enable the operator to repair, if present, the associate injuries to the abdominal viscera should not be undertaken. To sew up an injured diaphragm and leave a perforated bowel or stomach would certainly prove disastrous. Through an abdominal incision, the extent of injury to both diaphragm and abdominal viscera could be absolutely determined. If it was found that the wound in the diaphragm was so situated that it could not be repaired through an abdominal incision, thoracotomy could be done at the site of the chest wound, resecting an inch or two inches of rib. With the hand in the abdomen, the diaphragm could be pushed into the thoracotomy wound, making the work of repair quiet easy. A method which he had found very useful in dealing with injuries of this character consisted in leaving both ends of the first suture long, using one as a tractor. This method enabled the operator to work through a very small incision, and would frequently do away with the necessity of resecting more than a portion of one rib.

The mortality of this work would always be high. Many of these cases were mortally wounded when seen by the surgeon. There were, however, quite a few whose injuries could be repaired with satisfactory results, if operation was undertaken early. He urged that more attention be paid to penetrating wounds of the lower chest, and that early exploration be undertaken as a routine procedure in all cases where injury to the diaphragm was suspected.

REFLEX DYSPEPSIAS IN ABDOMINAL AND PELVIC DISEASE, AND THEIR SURGICAL TREATMENT

Dr. Herman E. Hayd of Buffalo said: 1. The intimate nervous supply of the abdominal and pelvic organs often made one organ reflect and masquerade symptoms which represented the disease of the other. Chronic appendicitis, retroversions, and floating kidney very frequently produced very marked dyspeptic symptoms. Gall-bladder disease, and often stones without jaundice, was treated for simple dyspepsia. 2. He made a plea for the more careful examination of operative cases. Frequently, many organs were involved in the symptomatology, and the patient remained uncured because of incomplete surgery. 3. Serious stomach diseases producing various dyspeptic symptoms, such as ulcer, hour-glass contraction, pyloric obstruction, chronic gastritis with dilata-

tion and early cancer, should be placed among the curable surgical diseases, and should receive the unquestioned benefits of early surgical interference.

INTESTINAL OBSTRUCTION DUE TO GALL-STONES

DR. MILES F. PORTER of Fort Wayne, Indiana, said that gall-stones might obstruct the bowel in five different ways, obturation being the most usual form, and most common in females past middle life. The stone might get into the bowel through the common duct, but usually entered from the gall-bladder by obturation, via the duodenum, and might lodge anywhere from the pylorus to the anus, but in the majority of cases was found in the ileum. As a rule, the gut was not damaged, but gangrene and perforation occurred if the obstruction was not promptly relieved. The symptoms were those of acute, but often not complete, obstruction of the bowel. A previous history of gall-stone disease was found in most cases. A migrating tumor originating in the gall-bladder, or a stationary tumor of egg size and shape, and hard, was of great diagnostic value, but absent in most cases. Tenderness and rigidity were not present until late. Shock was not marked. Multiple attacks of bowel obstruction were significant of gall-stone ileus. Exploratory incision was the best means of making the diagnosis in the majority of cases. The mortality was fifty per cent. This large mortality was due in no small measure to the advice given by many authors to delay operation until a fair trial of medical treatment, massage, etc., had failed. The mortality might be reduced to five per cent by prompt surgical interference. The author reported two cases. Both patients were women past forty, both gave histories of previous gall-stone trouble; the stone lodged in the ileum in both cases. One had had a tumor in the region of the gall-bladder, which disappeared before obstruction came on; one was treated medically, and died; the other was subjected to enterotomy, and recovered.

SOME POINTS IN THE DIAGNOSIS AND TREATMENT OF ACCIDENTAL HEMORRHAGE

DR. ADAM H. WRIGHT of Toronto, in considering this subject, said that several differences of opinion were prevalent both as to the diagnosis and treatment. The following procedures were conspicuous in this regard: Rupture of the membranes, plugging the vagina, accouchement forcé, and Cæsarean section.

The mortality rate of accouchement forcé, when the patient was suffering from shock, and the uterus was tetanically contracted, was, in his opinion, one hundred per cent. He knew of no operation in obstetrics or surgery respecting which one could speak more definitely. A certain amount of force might, however, be used under certain circumstances. For instance, the obstetrician may have ruptured the membranes before the os was dilated; there might still be considerable hemorrhage, making an early emptying of the uterus advisable. In such a case, manual dilatation of the os, with version or forceps delivery, might be advisable. It was doubtful, however, whether such manual dilatation, under such circumstances, should be designated accouchement forcé. He had had no experience with vaginal or abdominal Cæsarean section for accidental hemorrhage. In the case of either concealed or combined internal and external accidental hemorrhage, with the patient suffering from shock and a cervix as hard as iron, any operation would probably be unjustifiable. Shock should be properly treated, and if the symptoms of shock grew worse, the patient was probably going to die. If, on the other hand, the patient recovered from the shock, it was certain that in come cases, if not in the majority, serious operation was not advisable. It might happen, however, that internal hemorrhage was taking place into a uterus whose walls were stretching rapidly, and the loss of blood was the chief factor. If, in such an emergency, it was not possible to dilate the os, and deliver soon enough to save life, some form of Cæsarean section might be deemed advisable.

DIFFUSE PERITONITIS

DR. JOHN B. MURPHY of Chicago reported thirty-six consecutive cases of general suppurative peritonitis from perforation, with one death.

In treating this condition he emphasized the importance of relieving pressure and of instituting drainage, doing as little surgery as possible. The patient should be put in a sitting position both before and after operation, so as to keep the infective material out of the diaphragmatic zone, and not the pelvic zone. At the time of operation, usually the patient has all the infection he can possibly carry; he or she, as the case might be, was handicapped, and it was the duty of the surgeon to eliminate that infection or intoxication as much as possible, and in doing so, care should be taken not to abrade another square inch or half of a square inch of surface so as to admit more infective material. The patient should be tided over for a few hours and his local resistance built up by washing out the blood with normal salt solution. Antistreptolytic serum should be employed. Little or no food should be given, as what hastened absorption of infective material in the diaphragmatic zone was peristaltic action.

ABUSE OF PURGATIVES

DR. EDWIN WALKER of Evansville, Indiana, said that purgatives were probably the most widely used remedial agents. They were used by the public and profession under widely adverse conditions. This promiscuous use was productive of much harm. Our knowledge of the physiology of the intestinal canal was painfully deficient, and its pathology was not well understood. The best authors differed as to the physiological action of purgatives. There was certainly a close resemblance between infections of the intestinal canal and the action of purgatives. All of these considerations suggested care in the use of cathartics. In constipation, purgatives were contraindicated; in diarrhœa, they were limited in value. Biliousness was too vague a term to be considered as an indication for their use. They should rarely be used in the preparation for surgical operation, or in the complications following it. Increased knowledge would, no doubt, materially curtail their use.

A CONSIDERATION OF THE FACTORS WHICH HAVE LOWERED THE OPERATIVE MORTALITY AND IMPROVED THE POST-OPERATIVE RESULTS

DR. X. O. WERDER of Pittsburg said, in summing up, the causes to which he attributed his better results both in regard to operative mortality, as well as post-operative morbidity, were: 1. A more simple and better aseptic technique, including the wearing of rubber gloves for all hands concerned in the operation. 2. Better diagnosis and more careful preparation of the patient, especially the acute inflammatory cases, whose abdominal section is delayed at least three weeks after the subsidence of all acute symptoms. 3. The employment of a trained, absolutely reliable first assistant. 4. Centralization of all operative work, enabling the operator to give the greatest amount of personal attention to his patients. 5. The careful closure and covering of all raw surfaces in the peritoneal cavity. 6. The exclusive use of catgut prepared under personal supervision. 7. A trained anæsthetist who administers a minimum amount of anæsthetic consistent with good work.

THE MANAGEMENT OF BOWEL OF DOUBTFUL VITALITY IN OPERATIONS FOR THE RELIEF OF STRANGULATED HERNIA AND INTESTINAL OBSTRUCTION

DR. RUFUS B. HALL of Cincinnati said that the injured bowel in all these cases could be divided into three groups as soon as the operation had progressed to the stage where it could be inspected. 1. Those cases where it was clearly evident that we did not have to make a resection. 2. Those cases in which it was positively certain that a resection must be made. 3. Those cases in which the surgeon was always in doubt as to the vitality of the injured portion of bowel. Whether it occurred in internal obstruction or in incarcerated bowel in a strangulated hernia, it was to the treatment of this uncertain condition that he desired to call attention. He had devised a means which had proved eminently satisfactory to him in a number of cases. The method consisted in employing a single layer of iodoform-gauze about three inches broad, placing it against one side of the mesentery and carrying it over the diseased bowel until it rested upon the mesentery upon the opposite side, extending a couple of inches beyond the bowel of doubtful vitality upon each side, and placing this loop of bowel, surrounded by the gauze, just inside of the abdomen. The wound was dressed, if it was intra-abdominal, by leaving one or two stitches untied; if a hernia operation, as an open wound, leaving the end of the gauze surrounding the bowel projecting out of the wound a foot or more, so there was no danger of loosening it inside. The method was not applicable in all kinds of bowel injury, and was not advised, except in certain definite conditions and surroundings. Cases were reported illustrative of the method.

THE UTILIZATION OF THE BROAD AND ROUND UTERINE LIGAMENTS IN SUPRAVAGINAL HYSTERECTOMY

DR. WALTER B. DORSETT of St. Louis pointed out that in impacted cases of myomatous uteri, as well as in large abdominal tumors of the uterus, a tendency to a shortening of the vagina followed the operation, and a sacculation of the bladder, also, was apt to ensue. This was obviated by folding the remaining portion of the broad and round ligaments on themselves, and attaching them to the stump of the uterus. In cases in which it was desirable to leave the ovaries, they were maintained in a better position and never became prolapsed.

SOME OBSERVATIONS AND EXPERIENCES RESPECTING THE SYMPTOMS AND TREATMENT OF ATRESIA VAGINÆ

DR. AUGUSTUS P. CLARKE of Cambridge, Massachusetts, said that inflammation occurring in the vaginal tract might become the exciting cause of atresia vaginæ. Adhesions of the labia or other parts in the vicinity might interfere with the normal parturition, if not prevent the menstrual flow. In atresia hymenalis, the obstruction would usually be complete, and thus give rise to collections of

blood or mucus high up in the vaginal introitus. Such a condition could be relieved only by surgical measures. The author had met with cases of atresia in which firm bands of cicatricial tissue had formed laterally between the middle and upper segments of the vaginal walls. Traumatic cases could often be cured by resort to operative measures. Congenital cases could not always be satisfactorily relieved. In those cases in which the uterus and Fallopian tubes were in a mere rudimentary condition, surgical attempts for relief would, for the most part, prove useless. In two cases in which the cause was due to extensive laceration and sloughing of the parts on account of traumatic lesions during parturition, subsequent pregnancy failed to take place. In the treatment of cases in which surgical measures had been resorted to, the employment of hard vaginal dilators and iodoform-gauze was found to be of much benefit.

The author reported a case in which the vagina, at the time labor began, was so much contracted that an artificial opening by an extended incision had to be made before the patient could be delivered. The incision was made transversely, midway between the meatus urinarius and the anus and the lower portion of the sacrum. Considerable depth of areolar tissue had to be broken down before the cervix was reached. Delivery by the feet was then accomplished. The patient's age was 27 years. The cause was due to extensive sloughing of parts after a previous labor. Bimanual examination, so far as it could be carried out, assisted by rectal indagation, will be helpful in reaching a decision as to whether or not the uterus and adnexa are absent. Their non-existence might be further strengthened by the absence of the vagina and clitoris. Accumulations of blood high up, causing consequent pressure on the bladder and rectum, accompanied with symptoms of recurrent menstrual pains, afforded strong evidence that surgical measures should be resorted to. In some of the cases in which atresia vaginæ supervened after parturient processes, and in which extensive sloughing is also noticed, the mucous tissue was found to have undergone destructive changes at a number of different points throughout the vaginal canal. Nearly all cases of the accidental or acquired class might be relieved by operative treatment. In congenital cases, radical means for relief would prove useless. Such cases were due to the non-differentiation of the original kidney duct into the Wolffian and the Müllerian duct. The proper formation of the latter was absolutely essential to the development of the adnexa, the uterus, and the vagina.

PRESERVATION OF THE VAULT OF THE VAGINA IN PELVIC OPERATIONS

Dr. A. Vander Veer of Albany, New York, said that one could divide the life of a female into three periods — through puberty; through marriage and the birth of her first child; and through the menopause. At the period of puberty we had to consider carefully the functions of the ovaries and malpositions of the uterus more particularly. At the time of her first confinement we had to consider the possible lesions that may present, notwithstanding the most earnest care on the part of the obstetrician. We should consider carefully the possible morbific changes that come at the time of the menopause.

The paper dealt more especially with those lesions where, in an operation, the vault of the vagina is encroached upon. In malignant growth the surgeon was in doubt, in this region of the body, as to how much normal tissue should be preserved. He was led to emphasize the axiom of practice, to preserve normal tissues as much as possible, and under no circumstances to remove healthy organs. He would make but one exception to this; namely, the appendix, when found anatomically or pathologically incorrect.

Vaginal hysterectomy for varied lesions of the uterus required separate consideration for each individual case, with due regard to post-operative contractures, and disturbance of function of other near-by organs. This was seen at times in a constant dragging pain, due to disturbance of the sigmoid flexure, and interference with the rich blood and nerve supply of the pelvic organs. Most commonly was it expressed in bladder or rectal conditions.

In abdominal operations there was a difference in the nature of the procedure as between a malignant or non-malignant condition. Whatever method was adopted, he believed the one important object in view should be to bring the stump well up in position, that it might hold the vault and fornix of the vagina, prevent sagging, and especially the dragging upon any of the nerve trunks or large vessels. The author had found that the old extraperitoneal method of hysterectomy had preserved the vault of the vagina very acceptably, there being less complaint of pressure of the cervix downward upon the rectum, or against the tip of the coccyx.

In extensive operations the surgeon should not promise too much, and should remember that nerve lesions followed with accompanying symptoms require great patience on the part of the physician and surgeon, as well as of the patient, to overcome. To illustrate:

In case 1, Mrs. B. B., aged 28, married at 17,

had child at 19; tedious confinement; severe laceration of cervix and perineum. The latter was repaired successfully about a year later. Abdominal symptoms not relieved, and supravaginal hysterectomy eighteen months after birth of child. Cervical discharge continued, and cervix removed three years later. Appendicitis, with appendectomy two months later. One and a half years later, bladder trouble began. Treated by dilatation, with some improvement. Patient then came under the author's observation. Thorough examination showed misplaced bladder caught in post-operative contractures. Patient otherwise in very good condition. Here was a case for careful thought and review. Did the woman have a specific discharge at the time the cervix was removed? He believed not, and yet, could the woman have been relieved of this discharge and made a well woman, how fortunate it would have been for her. She now had a troublesome, irritable bladder; destruction of anatomical relations had left her maimed for life, and she presented the sad side of extensive operative intervention.

In case 2 there were presented lesions which gave the patient much distress. Miss A. B., aged 30 years, with usual history of growing myoma. Operation for appendicitis ten years ago, with excellent results. Abdominal route chosen and myoma removed. Good result. Examination one year later showed good operative result, yet patient complained of a slight feeling of weight in the rectum and of constipation. This was relieved medicinally.

In considering recognized cases of malignancy, all organs within the pelvis should be removed, as these conditions frequently occurred at a time in life when all functions had ceased. He had noticed a tendency post-operative to sacculation of the bladder, one of the embarrassing conditions for the surgeon to overcome. Surgeons should exercise great caution and study carefully, when leaving the ovaries, as to redundant tissue and adhesions forming which might result in sacculation of the bladder.

PERITONEAL ADHESIONS

Dr. Robert T. Morris of New York City said that we had as favorite fields for chronic peritoneal adhesions the region of the cæcum and appendix, the gall-bladder, the sigmoid region, and pelvis. From which group of adhesions do we get the greatest amount of disturbance calling for attention on the part of the surgeon? He thought from the region of the gall-bladder — the bile tract. Why? Because in this region we were near the great semilunar ganglion, and because the organs in the vicinity of these adhesions were more movable than those in the vicinity of the other common groups of lesions, so that the effect of a liver which moved with every inspiration and pulled upon adhesions, the effect of a diaphragm which moved with every inspiration and pulled upon adhesions, and the effect of the movement of the stomach, which was persistent, would give more disturbance in the region of the gall-bladder and bile tract than any other group of adhesions. Next in the order of importance, he believed, was the group of adhesions in the region of the cæcum and appendix. Attention was directed to adhesions in the pelvic region, which, although extremely common, did not call for so much interference on the part of the surgeon as the other groups of adhesions, for the reason that the viscera involved rested upon the pelvic floor, and were not subject to such constant and varying degrees of friction. Adhesions about the sigmoid were referred to. These, he said, gave rise to comparatively little disturbance.

As to treatment, there were certain instances in which patients suffered from peritoneal adhesions that did not call for much surgical attention. In these cases the minor psychoses should be ruled out.

As to the method of caring for adhesions, he first began by simply separating them. While in Berlin he saw Martin rubbing adhesions with oil. He tried that for a while, without getting marked results; then he followed the plan of filling the peritoneal cavity with saline solution after operation. But this was not wholly satisfactory, because the salt solution was absorbed too rapidly. He then adopted the method of using the aristol film, because he noticed, when raw peritoneal surfaces were exposed to the air, there was a tendency for a lymph coagulum to form. If one included in the lymph coagulum an insoluble material like aristol, he included something which offered a mechanical obstacle to readhesion at that point. So this happened to be one of the many things with which he experimented. The tri-iodide of thymol offered the best mechanical protection, in that it made a smooth coagulum with the lymph and remained for a long time in rabbits. He kept the rabbits a year, and found it was still present.

He had found practically that in rabbits and in human beings the Cargile membrane would prevent the recurrence of adhesions very regularly, although not completely sometimes. Sometimes the surgeon might have to repeat the operation. He expressed himself as being unwilling to state which was the better of the two, the Cargile membrane or the aristol film. In their proper places, both were distinctly valuable.

ABSTRACTS OF CURRENT LITERATURE

DEPARTMENT OF SURGERY

UNDER THE CHARGE OF

JOHN B. MURPHY, M. D. — E. WYLLYS ANDREWS, M. D.
FREDERIC A. BESLEY, M. D. — WM. R. CUBBINS, M. D.

CONCERNING INTESTINAL DISTURBANCES AFTER OPERATION UPON THE STOMACH. Willy Anschütz.

Intestinal disturbances following operations upon the stomach can arise from a variety of causes. Diarrhœa not infrequently is associated with septic processes in the abdominal cavity. Anschütz once observed, in a case of gangrene of the transverse colon following a resection of the stomach, frequent discharges of hemorrhagic intestinal contents. The stools were thin, brownish red, and followed immediately the conclusion of the operation. Slight intestinal disturbance can result from inflammation of rectal mucous membrane, following the use of nutrient enemata.

In the Breslau clinic the nutrient enema is used extensively after operation upon the stomach and intestines. This is not the nutrient enema, in the ordinary sense. It consists of from 100 to 200 cm. of water or physiologic salt solution, with or without the addition of one third the volume of wine, and is given four to eight times daily. Anschütz has never seen severe intestinal disturbance following the use of this enema, and in numerous cases it has been continued for ten days. It is to be noted that, as a rule, the diarrhœa is not dependent upon any known error in diet.

Frequency. Anschütz cannot verify the statement that diarrhœa is a frequent complication. It has been observed scarcely thirty times, in more than five hundred cases.

Post-operative intestinal disturbances may be considered in the following groups:

1. After typical gastro-enterostomy with normal short loop. (*a*) In cases of carcinoma of the stomach. (*b*) In cases of benign lesions.

2. After faulty gastro-enterostomy, where too long a loop has been used.

3. If the normal passage has been re-established in the course of the operation. (Pyloroplasty resection of the stomach, after Billroth's first method.

GROUP 1. Diarrhœa of varying severity occurred seven times after gastro-enterostomy for carcinoma of the pylorus. In these cases the relatively late onset of the diarrhœa, six or ten days after the operation, was probably the most characteristic thing. Its duration and severity varied. There was always considerable retention in the stomach and some lactic acid. The anterior gastro-enterostomy with the Murphy button was performed. The diarrhœa developed in spite of a liquid diet and rest in bed, and in four cases resulted fatally; in three cases, the diarrhœa disappeared in from five to fourteen days, or was so much improved that the patients could leave the hospital. In the three favorable cases the general condition of the patients was not much affected. In two of the three cases the diarrhœa yielded readily to astringent treatment; in one case an intestinal catarrh persisted.

Cause of Diarrhœa. Little attention is paid in the literature to this dangerous complication. Carle and Fantino observed a case in which one month after a posterior gastro-enterostomy diarrhœa began. Vomiting of foul-smelling stomach contents had occurred frequently before the diarrhœa began. The patient died on the fifty-seventh day. A patient of Hartmann's developed a diarrhœa on the twelfth day following an anterior gastro-enterostomy and died three months later. No demonstrable cause for the diarrhœa.

Different factors co-operate in the production of this post-operative diarrhœa. Before the operation in all of Anschütz's patients there was a high grade of pyloric stenosis, through which fermenting gastric contents passed slowly and in small amounts.

The diet was not restricted and the stomach was not regularly emptied, so that it is probable that the fermentation was greater before the operation than immediately after. The stomach contents did not produce a diarrhœa before the operation, because the activity of digestive juices, especially the pancreatic juice and bile, was not reduced. They had even less work than usual to perform, because only liquids or small solid particles, and always in small amounts, passed the pylorus. These could be easily digested and transformed into absorbable products.

The conditions change after the operation. The

contents of the diseased stomach are rapidly discharged; the motility of the stomach is favorably influenced; the fermentation lessens and finally disappears. So far the condition is improved. The disadvantage is that the food does not pass through the duodenum (if the pylorus is completely closed). We know from Pawlow's investigations that the secretion of pancreatic juice follows stimulation of the duodenum; Kelling has demonstrated the same thing for bile.

If the food passes directly into the jejunum, this reflex is not so prompt; the secretion is defective. In any case, its union with the stomach contents is not so close as in normal conditions, and so, as Kelling thinks, the digestion is not so complete and the possibility of fermentation greater. The intestinal catarrh could easily be caused by this abnormal decomposition.

Another disadvantage is, that the stomach contents come directly in contact with the mucous membrane of the jejunum, and part of the intestine, unused to and unprepared for it.

In severe cases the patient passes into a state of chronic intoxication or dyspeptic coma. (Carle and Fantino.)

Individual Predisposition. Individual predisposition cannot be left out of consideration. Carcinomatous cachexia, as tuberculous and septic cachexia, results in a lessened resistance of intestinal mucous membrane, with a tendency to intestinal catarrh, and in advanced cases of carcinoma of the stomach, this disturbance frequently occurs. A patient with a gastro-enterostomy functionating well from the beginning may die of an intestinal catarrh.

Gastro-enterostomy for Benign Lesions. A loop 40-50 cm. below the duodeno-jejunalis is employed. Among more than sixty cases of gastro-enterostomy done for benign stenosis and ulcer, intestinal disturbance was noted but once, and this disappeared in twelve to sixteen days after the operation. According to Kelling, the diarrhœa is caused by the action of the non-neutralized hydrochloric acid upon the intestinal mucous membrane. Kelling bases his view that the hydrochloric acid causes the diarrhœa upon animal experiments made by himself and others. Matthes has demonstrated that injection of artificial gastric juice into the lower part of the small intestine produces a catarrh and destruction of epithelium. According to Peterson and Machol, the hydrochloric acid plays no such decisive role. In about eighty cases of gastro-enterostomy for benign stenosis or ulcer, diarrhœa occurred three times. It lasted some time, but never became serious. According to Anschütz, it is more difficult to determine the essential cause of the diarrhœa after gastro-enterostomies for benign than malignant conditions. The lower intestinal loops, especially the ileum, may be irritated by stomach contents, even if they do not contain hydrochloric acid. The beginning of the jejunum in patients with benign lesions is not so sensitive, and if intestinal disturbances arise, they are quickly and easily overcome, without any injury to health. In the rare cases in which death results, an abnormally low resistance is probably at fault.

GROUP 2. In the Lüke-Rockwitz procedure a loop of convenient length was used for the anastomosis. It is easily understood that a low loop of ileum was occasionally used, and it is a wonder that unfortunate accidents did not occur more frequently. It is characteristic for a part of these cases that the severest intestinal disturbances began almost immediately and resulted without delay in inanition and death. In a case of Lauenstein, a loop 40 cm. above the ileocæcal valve was used, and the patient died on the eleventh day, of inanition. Other cases have been observed, however, in which the disturbances were not so severe.

Numerous animal experiments by Monari, Trzebicki, and Nagano have demonstrated that extensive resections of the small intestine are attended by serious consequences. The animals develop a diarrhœa and die of inanition. The mucous membrane of the jejunum is thicker and contains more folds than that of the ileum, and is better adapted for hypertrophy and less easily spared.

If a lowly lying loop is used, a part of the stomach contents passes directly into this part of the intestine; it does not mix with the pancreatic juice and bile, and is not prepared for its short stay in the intestine.

In Lauenstein's case, food particles were found in the fæces one half-hour after their ingestion. The cause of this intestinal disturbance was a mechanical and chemical irritation of the mucous membrane of the ileum by stomach contents.

GROUP 3. It is interesting that in all the cases of this group in which a resection of the stomach was done, the focus of fermentation removed, that there was a tendency to diarrhœa, although no retention was present. The stomach performed its function after the operation and emptied itself completely. The only possible explanation in these cases is that many individuals cannot withstand the rapid emptying of the stomach after the removal of the pylorus, or that they are predisposed to diarrhœa as a result of their weakened condition. Anschütz is inclined to accept the latter as the most plausible explanation.

Occasionally, in patients with carcinoma of the

breast, a tendency to diarrhœa is observed, although there is no intestinal involvement.

Carle and Fantino believe that chloroform plays a significant role in the ætiology of this condition. They state that they frequently see patients with a gastro-intestinal catarrh, which is caused by chloroform. In cachectic individuals, lacking hydrochloric acid, it is not surprising that chloroform should increase intestinal putrefaction. Anschütz cannot agree with this view; he always previously used choloroform, and intestinal catarrh was noted very seldom.

No therapeutic measures avail in the severe cases. The most important thing is, that any intestinal disturbance be immediately noted, and the least anomaly of the stool be handled with care and seriousness. It has been attempted to replace the hydrochloric acid when absent, or when present, to neutralize it with alkalies. No results were obtained. Gastric and intestinal lavage has been employed repeatedly. They have attempted to remove the harmful intestinal contents with castor-oil, Carlsbad salts, and calomel.

Astringent remedies have been employed. The diet should be restricted. Latterly, in the severe cases the patients have been nourished subcutaneously with salt and sugar solutions and fat. In the milder cases the best results have followed the use of a combination — bismuth, tannigen, and opium. So soon as a patient shows a tendency to diarrhœa after a stomach operation, large doses of bismuth (1.0) and tannigen (0.1) are given, and 10 drops of opium every one or two hours.

If too low a loop has been used, as in one of Anschütz's cases, the loop used should be separated and a shorter loop employed. If a little too low a loop has been employed, a broad enteroanastomosis, as recommended by Kelling, may have some effect. — *Ueber die Darnstörungennach Magenoperationem. Mittiel. a. d. Grenzgebiet d. Med. u. Chir.*, xv, 305, 344. DEAN D. LEWIS.

PAPILLARY GROWTHS IN THE GALL-BLADDER, AND THEIR RELATION TO CHOLELITHIASIS AND CARCINOMA. By F. Pels-Leusden.

Pels-Leusden summarizes the history of a case of papillary growth in the gall-bladder. The tumor was made up, microscopically, of papillæ, having a delicate connective-tissue stalk, and covered with cylindrical epithelium. The arrangement of the epithelium was so complicated in places, that in order to differentiate the tumor from carcinoma, it was necessary to compare it with numerous sections taken from true carcinoma of the gall-bladder. This comparison, although it established some differences in structure between true infiltrating papillary carcinoma and the growth in question, nevertheless served to emphasize the fact that those gall-bladders which show a papillary outgrowth must be considered malignant, and must therefore be extirpated. The statistics of Riedel (52 cases of carcinoma in 650 gall-bladder operations) and Petersen (34 cases of carcinoma in 168 gall-bladder operations) illustrate the frequency with which carcinoma of the gall-bladder occurs. It is unquestionably true that many of these cases of carcinoma are instituted as a result of chronic irritation caused by cholelithiasis. The epithelium of a chronically inflamed gall-bladder very often undergoes a typical proliferation in the depths, and assumes a papilliferous form on the surface. It is not essential, however, that the gall-bladder itself should be the seat of a stone, in order for a papilliferous tumor to develop. A stone in the common duct, causing a damming up of bile and mucus in the gall-bladder, is as potent a factor in causing gall-bladder irritation as is a stone in the bladder itself. This fact is explained on the basis that in addition to the mechanical irritation caused by a stone, there are other irritative influences, such as those caused by the presence of bacteria or of bile of altered consistency or chemical character. An early result of this irritation is a proliferation of the lining epithelium of the gall-bladder, and this proliferation shows a marked tendency to go over into the formation of carcinoma. Such being the case, it is important that all gall-bladders that show evidences of chronic inflammation shall be removed, even if the inflammation be not far advanced. — *Arch. f. klin. Chir.*, bd. lxxx, h. 1, 1906. M. G. SEELIG.

ABSTRACTS OF CURRENT LITERATURE

DEPARTMENT OF GYNECOLOGY

UNDER THE CHARGE OF

J. CLARENCE WEBSTER, M.D. — E. C. DUDLEY, M.D.
JOHN C. HOLLISTER, M.D. — F. W. LYNCH, M.D.

THE USE OF GELATINE AND SUPRARENAL PREPARATIONS IN HEMORRHAGE. With especial attention to their use in gynecology and obstetrics. By Dr. Maximilian Neu, Heidelberg.

The author speaks first of the large amount of literature during late years upon the subject of suprarenal extract and its use as a therapeutic means, and then gives a review of the experimental work done. Siegfried Goldschmidt's monograph is especially referred to. Oliver and Schaefer's experiments in 1894 emphasizing the tension-raising action of the extract is given as the first work done during the late years. Ever since that time the suprarenal bodies have been especially studied anatomically, histologically, physiologically, biologically, and pharmacologically. Then the subject is taken up under two heads:

1. Function of the suprarenals.

2. Action of the extracts and chemical ingredients.

Study of the function of the suprarenals has given essentially the following results: Extirpation of the bodies leads, under all conditions, to death of the animal experimented upon, with the symptoms of asthenia, dyspnœa, and paralysis of the heart. Brown-Sequard's two-step operation had the same results, but death was prolonged. Removal of one side resulted in vicarious hypertrophy of the other organ and of accessory organs.

Total extirpation also resulted in an enormous sinking of blood-pressure, with coincident fall of the temperature.

Injection of the extract of the suprarenal neutralizes both to a certain degree, as shown by the experiment phenomena, without preventing the occurrence of death. As a further biological peculiarity, it is noted that muscle extracts from animals that have been artificially fatigued and whose suprarenals have been removed are very poisonous.

There are two theories:

1. Suprarenal is an organ with inner secretion, whose products enter the general circulation.

2. The action goes on in the organ itself, in so far as the fatigue products caused by the muscular activities are neutralized in the manufacturing of a heart and vessel tonic substance.

Advocates of both views are quoted.

As to where the action of the secretion is, Goldschmidt's view is given. (He thinks through the sympathetic to its end branches.) "Should this theory prove correct, it would be analogous to Hans Meyer's results in regard to the spreading of the tetanus-toxin by the nerves."

The principal action of the extracts from the organs (adrenalin, suprarenin) is:

1. Increase in blood-pressure, combined at first with a slowing and increasing in volume of the pulse-beat.

2. Strengthening and acceleration of the heart action; also, breathing becomes more superficial and rapid, and expiration prolonged.

Further observed actions, by irritation of the sympathetic, are a contraction of the arrectores pilorum, of the uterus, of the seminal vesicles and vas deferens.

Its blood-pressure action is through vasoconstriction. Local application by resorption along the nerve fibers irritates the vessel musculature and causes contraction.

The action on the heart — slowing of the pulse — should be considered as irritation of the vagus nucleus following the momentary elevation of the pressure.

Läwen and Erb's experiments are referred to.

Clinical value from experimental results is based upon:

1. Direct stimulation of activity of the heart.

2. Contraction of arteries and capillaries by its action on the smooth muscle fibers and directly on peripheral nerve elements.

The blood-vessels of different organs react in different degrees; strongly in the skin, less strongly in the stomach, intestine, and bladder; in the lung vessels, absolutely not at all. Concentrated solutions are necessary to affect the larger vessels.

The drug, therefore, has a manifold use in therapy, on account of its causing anæmia as well.

Relative contraindications are:

1. Arteriosclerosis.

2. Gravidity (contractive action on uterus).

Dosage. The different views are quoted, and the following statement is made: Hildebrand published as a maximum dose of the German suprarenin, which we find especially recommended, as ½ mg. (15 drops of the one-per-cent stock solution). This amount to be used only in the rarest cases. External application (mucous membrane) much more, as absorption is retarded by anæmia.

Symptoms of poisoning are: Dizziness, headache, nausea and vomiting, weakness, collapse, heart palpitation, precordial pain. Glycosuria and skin gangrene have also been reported.

Therapeutic Uses. The author refers in brief to the use of the extract in ophthalmology, rhinolaryngology, otology, odontology, dermatology, urology, internal medicine, and in general surgery, and then takes up more in detail its use in gynecology, with authors quoted.

Cramer. Stopping the hemorrahage in a bleeding portio carcinoma. He also recommends its use in uterus and cervix catarrh and after curettage (sound with cotton swab wet in 1-2000 solution for one to two minutes), also before curettage, to prevent so great a collection of blood.

Peters. Added to the above, its use before the use of steam to cause anæmia, and therefore drying.

Rhodes and Scott. Used it in hemorrhages.

Stenisschneider. Recommended it "in all cases where there is abundant uterine hemorrhage, where no marked anatomical changes in uterus or adnexa could be found."

B. Müller. Injected into the uterus 1 c.c. of a 1-3000 solution for hemorrhagic endometritis. In one case he had very severe poisoning symptoms, lasting an hour (collapse, etc.). The "blood-stilling" action of an intrauterine muscle injection lasts without intoxication, at the longest, 12 to 24 hours. Systematic use of injections prevented the strongest hemorrhages. Temporarily, this is aided by tamponading with suprarenal gauze.

Peters. Used the drug, also, with silver nitrate solution in a very marked thickening and irritable condition of the urethra in a case of chronic gonorrhœal urethritis.

Used also by *Peters-Cramer* and *B. Müller* in acute vulvitis and pruritus vulvæ et ani.

Phaenomenoff. Found a negative action on the vaginal mucous membrane, but, on the contrary, a marked stasis action on the portio and uterine mucous membrane. Also, a reflex action on the whole uterine musculature was found.

In operations the drug has been used in:

Removal of mucous polyps of the uterus.

Emmet's operation.

Removal of a uterine horn.

Amputation of portio.

All free from hemorrhage.

B. Müller. Used the suprarenal preparations on account of their stiptic action in obtaining a section for examination from the portio-vaginalis, opening of the vaginal vault, total extirpation, myomectomy, etc. Of great value, especially when the largest vessels are also clamped.

Dangers of intoxication when used on the mucous membrane not so great as when injected into uterus. Never more than .0002 at a time should be injected into the uterus, while up to .00075 can be used in the former.

Müller believed that the local anæsthesia (cocain and suprarenin or adrenalin) would find as much use in gynecology as in surgery.

Freund emphasizes the fact that the more absolute hæmostasis caused by the use of the drugs in plastic work lessened the later oozing.

Used also by *Müller* to stop oozing from peritoneal adhesions (one either moistens the adhesions before cutting by a one-per-cent solution, or later checks it by tamponing with suprarenal gauze).

The author thinks the two points brought out by Pick's experiments cover the therapeutic indications of the drugs; namely:

1. "The agent must either (which is almost self-evident) reduce the heart's power, and therefore the blood-pressure, without causing a stronger dilatation of the vessels; or

2. "It must cause a vessel contraction in a marked degree, so that the synchronous increased blood-pressure in its inflow is compensated for by the weakness of the outflow."

Similar experiments with adrenalin on the uterus of an intact animal and on the isolated organ of the same animal gave similar contraction curves. It narrowed very strongly the vessels of the isolated uterus. Experiments prove that the blood current in the uterus was slowed 83 to 100 per cent in comparison with the normal. Adrenalin causes, at times, when the contraction of the uterus is not at all influenced, a decided narrowing of its vessels. Its action seems therefore to be more constant upon the vessels than on the individual muscle itself."

A long list of articles in the literature is appended. —*Die Nebennieren präparate und die Gelatine als blutstillende Mittel.* J. C. HOLLISTER.

ABSTRACTS OF CURRENT LITERATURE

DEPARTMENT OF OBSTETRICS

UNDER THE CHARGE OF

C. S. BACON, M.D. RUDOLPH W. HOLMES, M.D.
C. v. BACHELLÉ, M.D.

PAINLESS LABOR. By Wolff.

Absolutely painless labor has been observed in patients suffering from myelitis or tabes. Olshausen, several years ago, called attention to the fact that, especially in cases of placenta prævia, women may be in labor for a number of hours without experiencing any pain. This phenomenon is by him explained by the unusual softness and succulency of the cervix in these cases. Decidedly rare, however, are the records of absolutely painless labors in normal women. A case of this kind is described in this paper by Wolff. The patient is a primigravida, 28 years old; menstruated last, April 6, 1904. Wolff was called by the attending midwife on January 22, 1905, 2:30 A. M. Although the membranes had ruptured at 4 P. M. the preceding day, the patient had not as yet experienced any pain. Uterine contractions at that time could easily be palpated. The head was found in the pelvis, the os open to the size of palm of hand. The patient received a small dose of chloral hydrate and morphia, in the hope that after some rest the uterine contractions would become more effective. The next morning the uterine contractions were still distinct, but still absolutely painless. The head was found in pelvic outlet, not rotated; os completely dilated. The patient did not feel the slightest inclination to use her abdominal muscles. Later in the day a living child was extracted with forceps.

A very careful physical examination of the patient did not reveal the slightest anomaly. There were no symptoms that indicated hysteria or an organic lesion of the nervous system. It was thought that this anomalous lack of sensibility in the genital sphere might be due to an incipient tabes, but another examination, made half a year later, excluded such an assumption. An interesting point in this case was the absence of a reflectory action of the abdominal muscles in the second stage of labor; a phenomenon which also has been observed during the painless labor of women who suffered from a myelitis or tabes, or were under the influence of a medullary anæsthesia.

Neither this case nor seven others of a similar nature, whose records are briefly quoted by the writer, permit any satisfactory explanation of such a total absence of pain during labor. — *Ueber schmerzlose Geburtswehen. Arch. f. Gyn.*, Bd. lxxviii, h. 2, p. 402. H. EHRENFEST.

DELIVERY DURING ARTIFICIAL SEMI-SLEEP ("DAEMMERSCHLAF"). By Gauss.

This paper contains a detailed report of five hundred labor cases in which the patients were kept in a semi-conscious condition by the use of scopolamine hydrobromate and morphia. By a very careful dosage of these drugs, Gauss attempts to get the parturient woman in a condition in which she indicates by slight moaning the acute pain of uterine contraction, but is still able to give rational answers to questions, dozes off between pains, and after completion of labor, finally wakes up without any recollection of the occurrences. The effect of these drugs upon different women is quite different, therefore no hard-and-fast rules can be given concerning the dosage. In some cases it was possible to keep the patients in the desired semi-conscious condition straight through labor; in others, this state was successfully attained only for a part of the time; a few (seven out of the total number) became actually violent, but quieted down, however, promptly after expulsion of the fœtus. Whenever obstetric operations became necessary, a general anæsthetic had to be given, and Gauss gave, as a preliminary injection, hypodermatically, 0.00045–0.0006 gram of scopolamine hydrobromate (Merck) with 0.01 gram morphia muriate. The full reaction of this injection should be noticeable within three quarters of an hour to three hours; if it fails to appear, another injection of 0.00015–0.0003 gram of scopolamine without morphia is given, the effect of this injection, as a rule, becoming evident within 15 to 30 minutes. After two or four hours, another injection may become necessary, when the second injection is repeated. If the patient appears to be arousing, about 0.005 gram of morphia is added. This medication, the author

assures, can be continued without any harm to the patient or the fœtus, even for several days. The largest collective dose used in one patient was 0.0031 gram of scopolamine with 0.00475 gram of morphia within 48 hours. The scopolamine-morphia anæsthesia, if properly used in this form, does not interfere with the progress of labor, does not show any harmful effect upon the later function of the breasts, and is free from any lasting ill effects upon the new-born child. In a few instances only, the fœtus was expelled in a peculiar condition, which called for prompt action. It was found that superficial irritation of the skin soon established regular breathing. Gauss mentions the following conditions as contraindications against the employment of the "Daemmerschlaf" during labor: Primary inefficiency of uterine contractions, general debility, all febrile conditions, anæmia, and all those conditions (typhoid fever, appendicitis, peritonitis, threatening eclampsia, etc.) in which it seems undesirable to obscure the clinical picture by procuring artificial semi-consciousness. — *Geburten im kuenstlichen Daemmerschlaf. Arch. f. Gynäk.*, bd. lxxviii, h. 3, p. 579.

H. EHRENFEST.

A NEW FROZEN SECTION THROUGH THE BODY OF A WOMAN WHO DIED IN THE SECOND STAGE OF LABOR. By Bumm and Blumreich.

Since the classical publication of Braune, comparatively few descriptions have been furnished of sections which represent the normal conditions of labor. It was Schroeder who first warned against an erroneous interpretation of certain findings in such specimens, which at first may appear normal, but by a more careful study are recognized as pathologic or as due to post-mortem changes, or as artifacts produced in the preparation of the sections. These frozen sections seem destined finally to settle the vexed problem of the lower uterine segment. Microscopic investigations have led to very valuable conclusions in the study of this new specimen. In this case the contraction ring is distinct, marking the upper edge of an extended portion of the cavity harboring the ovum. The mucosa just below this ring contains glands, which, in their general appearance, are identical with typical cervical glands, no decidual formation being found in this part of the mucosa. Since the portion of the uterine wall which is stretched and thinned is covered with a cervical mucosa, the conclusion must be drawn that the so-called lower uterine segment is not — as was first taught by Schroeder — a part of the uterine cavity. This case, which apparently represents the physiologic normal condition of the second stage of labor, proves that the cervix, in addition to the vagina, is only passively stretched, and that the uterine body *in toto* has solely an expulsive function. After a detailed description of the histologic findings in this case by Blumreich, in the second part of this interesting paper Bumm considers the problem of the lower uterine segment. He agrees with Schroeder that during pregnancy the cervix, as a whole, remains unchanged; only during the last few weeks the uppermost portion of the canal may become slightly dilated. From here the further dilatation starts during the first stage of labor. During this first stage, under normal conditions a stretching or relaxation of the lower segment never occurs. If, during the second stage, an obstacle of some sort necessitates an increased activity of the uterine muscle, that is, causes more frequent contractions of longer duration, then the line of demarcation between the retracting muscle and the passively stretched birth-canal becomes more noticeable. This line is then more appropriately called "retraction ring." From the histologic findings in his case, Bumm is forced to assume that the retraction ring appears at the internal os, and that the stretched portion below is cervix. Bumm is well aware of the fact that his findings and their interpretation are in direct opposition to the results of the examination of a very similar specimen by Barbour and Webster. They found cervical glands only in the lower half of the stretched segment, and recognize in the upper half a distended part of the uterus, because there fragments of fœtal membranes are found adherent to the mucosa. Bumm repudiates the interpretation of this latter finding, and suggests to Barbour a further search for cervical glands in the upper part of the thinned wall. — *Ein neuer Gefrierdurchschnitt durch die Leiche einer in der Austreibungsperiode verstorbenen Kreissenden. Zeitschr. f. Geb. u. Gyn.*, bd. lvii, h. 2, p. 235.

H. EHRENFEST.

THE ATTACHMENT OF THE PLACENTA IN THE CERVIX AND THE "LOWER UTERINE SEGMENT." By F. Hartmann.

Hartmann first ascertained in his case that the placenta was attached below the contraction ring, and found at the second examination that the contraction ring was identical with the internal os. The two most important conclusions drawn by the writer are, that the primary insertion of the fertilized ovum within the cervix is possible and that the so-called "lower uterine segment" is not a part of the body of the uterus, but is the dilated cervix. — *Ein Fall von Sitz der adhaerenten Placenta in der Cervix. Zeitschr. f. Geb. u. Gyn.*, bd. lvii, h. 3, p. 500.

H. EHRENFEST.

CORRESPONDENCE

UNNECESSARY OPERATIONS ON WOMEN

SURGERY, GYNECOLOGY AND OBSTETRICS:

The October number of your admirable journal contains a communication with the above title, by Dr. Arthur Dean Bevan, which casts undeserved reproach upon a class of honorable surgeons engaged in special practice. Such an indictment as is drawn therein should not pass unchallenged before the attention of your many readers. Every one who knows Dr. Bevan personally, as I do, knows that he is incapable of *intentionally* doing injustice to any individual or class of individuals, or to any good motive or principle. Hence I believe that his observations have been faulty, or perhaps unfortunate; for I am sure his deductions are unwarranted by the facts.

After tersely reciting the marvelous advances of modern surgery, which have resulted in rescuing thousands from otherwise incurable disease and relieving inestimable suffering, Dr. Bevan declares that with this great boon to humanity there has been developed *a curse*, which curse consists in the doing of operations which are unwarranted and unnecessary. He says the principal sufferers are women, who are prone to believe their sexual organs are diseased when consulting a physician, and ready to submit to operation, if advised. Further, the principal offenders have been men who have limited their work to gynecology; that "there are many gynecologists who do not think of taking charge of a woman except for an operation, and the percentage of women who apply to them for advice, and in whom they find no indication for an operation, is so small as hardly to form, as the chemist would say, a trace in the sum total." He then asks the question, "Are all these operations necessary?" and thus answers it, "In reply to this question, I shall say that my own impression of the surgical work done on women, especially that done by men who limit their work to gynecology, is, that certainly thirty per cent of it is unnecessary and unwarranted." In a word, Dr. Bevan declares that almost one third of the operations done by gynecologists are unnecessary and unwarranted. This is a most serious accusation, and if true, would justly deprive a large class of special surgeons of the confidence and respect of their professional brethren, and also of the general public.

I quite agree with Dr. Bevan that with the modern hospital and trained operating-room nurse, aseptic results are made easy, and, as a result, needless operations are done and operations are undertaken by those who have neither the knowledge nor the training to fit them for such work. But I deny that special surgeons have been given to this wrong more than general surgeons.

Unnecessary and unwarranted operations can only obtain from two causes: imperfect knowledge and skill, or dishonesty on the part of the surgeon who advises and does such operations. Now, is it true that gynecological surgeons are not the equals, in scientific knowledge and skill, of their *confrères* engaged in other departments of surgery? or are they less honest than other practitioners? Dr. Bevan says: "The same criticisms are to be made of the general surgeon or the operator in any specialty, who for fee, or through ignorance or misguided enthusiasm, submits a human being to the risks and costs of an unnecessary and unwarranted operation"; and again, "I have singled out the gynecologist because he is responsible for much of this work." It will be noted that our author leaves no one in doubt as to the particular body of practitioners to whom his accusation is directed.

Now, is it true that gynecologists are deficient in scientific knowledge or surgical skill? On the contrary, any account of the great advances and achievements of modern surgery would be glaringly inaccurate did it not concede to gynecologists a most conspicuous place both in its foundation and development. Who, in the development of abdominal surgery, which is the crowning glory of modern surgical achievement, did more to blaze the way than Marion Sims? He first, after the birth of antiseptic methods of operating, directed attention to the surgery of the gall bladder and ducts, and advocated immediate operation for penetrating wounds of the abdomen. Who, after Lord Lister, did more to simplify and perfect the modern operative technique, and, at the same time, to extend the scope of intraperitoneal surgery, than Lawson Tait? These two men are the founders of modern gynecology. And have their successors and followers been wanting in scientific knowledge or operative skill? Have the numerous men engaged in teaching and practising gynecology, in more recent years, proved unworthy of their predecessors? It is well known to the profession

that pelvic surgery in women has attained a degree of refinement and precision unsurpassed in any field of surgery, and that gynecological surgeons have borne a most conspicuous part in developing the surgery of the gall-ducts and liver, also of appendicitis and of the urinary tract. In a word, modern abdominal surgery is, in great part, an outgrowth of pelvic surgery, and gynecological surgeons have been foremost in this great achievement. Certainly Dr. Bevan cannot have these men in mind when he describes some gynecologists as having "so limitied their vision to their specialty that they believe that it and they are the center of the pathological female human universe, about which all else revolves."

The principal feature of Dr. Bevan's article to which my protest is directed is that he has singled out a special class of the profession to which he distinctly attributes an exceptional proportion of dishonesty and wrong-doing. This is altogether without any warrant. Gynecological surgeons, under every test, stand the peers of any other class of physicians or surgeons.

In the development of new fields of surgical work, some errors are unavoidable. I allude to the errors that are corrected by increasing experience and accumulating knowledge. Such errors have occurred both in special and general surgery. As apt illustrations I might cite the unnecessary removal of the ovaries which followed the pioneer work of Battey, Hegar, and Tait; and the excision of the coccyx for neurasthenic tenderness, for some time practised by general surgeons. In the correction of these errors, the gynecologists were foremost in stopping abuse and establishing correct standards of practice. This is attested by the extensive space devoted to conservatism in both the periodical and text-book literature of modern gynecology. I am sure of my ground when I say that in the practice of gynecologists, judging from my personal knowledge of their work, in quite one third of the patients who are referred or who apply for operation, operation is not done. It is my knowledge upon this point which impels me to resent Dr. Bevan's charge that thirty per cent of the operations done by gynecologists are unwarranted and unnecessary. Can the same discrimination in deciding the question of operation be accredited the general surgeon in gynecological cases as is exercised in those cases by the gynecologist? Does concentrated study and exceptional experience in a special field of research and practice impair surgical judgment and lessen one's resources in treating that class of cases? On the contrary, it is well known that error is more common with those of desultory and superficial study, with lessened clinical experience. Surely, no one would claim that the moral responsibility of a surgeon is affected by either special or general surgery. That is a condition inherent in the individual, and is not altered by any particular field of professional labor.

In conclusion, I must dissent wholly from Dr. Bevan's estimate as to specialism in medicine and surgery. Pervading his entire article is a depreciation of specialism in every department of surgery. If he would protest against specialism without broad general knowledge of pathology and training in general medicine and surgery, his position could not be questioned. But no one can belittle the great offices of special work — like neurology and pediatrics in medicine, or such as ophthalmology, gynecology, and orthopædics in surgery — in advancing scientific knowledge and perfecting the results of treatment.

The late Samuel D. Gross, the foremost surgeon of his day, died during the first decade of the antiseptic era. With clear vision he realized that the golden age of surgery was as hand. After recounting the advances clearly assured by Lister's great discovery, he wrote of the influences so potent in advancing surgery, as follows: "Specialism, too, is entitled to undying praise. It has penetrated with its methods and instruments of research the innermost recesses of the human body, and has achieved, in a comparatively brief period, triumphs which general surgery could not have achieved in half a century, if ever." I submit that these words are as applicable to the surgical work of the present time as when penned by the Nestor of American surgery.

LEWIS S. McMURTRY.

LOUISVILLE, KENTUCKY.

Fig. 3. Intracanalicular myxoma. Fresh appearance of cut section.

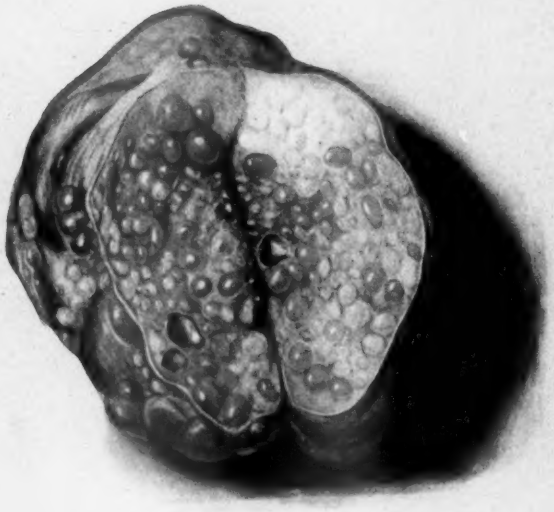

Fig. 13. Encapsulated cystic adenoma. Painting of fresh specimen.